MONEY, BANK CREDIT AND PRICES

LIONEL D. EDIE

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MONEY, BANK CREDIT, AND PRICES

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BY

LIONEL D. EDIE

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TO

ELMER BURRITT BRYAN

WHOSE GUIDANCE AND ENCOURAGEMENT
HAVE LED TO THIS WORK

WITHDRAWN

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PREFACE

Writing on the theory of money and prices in 1817, Ricardo declared, "Of those who give their attention to such subjects, none but the prejudiced are ignorant of its true principles." [1] Nevertheless in 1877, Francis A. Walker lamented the vagueness of understanding of such matters which had "done much to obscure the truth during the seventy-five years of economical discussion since it became current." [2] And in 1911, Irving Fisher remarked, "It has seemed to me a scandal that academic economists have been led into disagreements over the fundamental propositions concerning money." [3] The observations of Walker and Fisher are symptoms of more than a century of contentious discussion of money, bank credit, and prices which offers a most ironical commentary upon the optimism of Ricardo about the "true principles" of the subject.

Let it, therefore, be clear at the start that the present volume does not seek to add further controversy where a surfeit of controversy already exists. The dominating aim is to extend the positive and constructive analysis of the subject. The pursuit of this aim involves the following general lines of approach:

1. A restatement of the pure theory of the value of money in a form which lends itself to quantitative hypothesis, quantitative methods of investigation, and quantitative testing.
2. A breaking down of general concepts of movements and tendencies into standard time series—secular, seasonal cyclical, irregular—and a description of the shifting sequences and amplitudes of prices, credit, production, and other factors from phase to phase of the various types of movements.
3. A description of the bank mechanisms of adjustment through which prices and the means of payment act and interact upon each other and upon related factors in the business world.

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[1] *Principles of Political Economy*, ch. xxvii.

[2] *Money*, p. v.

[3] *Purchasing Power of Money*, p. viii.

4. An application of an institutional-genetic mode of treatment and point of view to the major concepts of monetary science.
5. A development of a technique of analysis useful not merely to "explain" price movements of the past, but also to predict, with due allowance for fortuitous events and the hazards of forecasting, the price movements of the future.
6. A critical evaluation of plans of price control and a development of standards of price control suited to achieve greater stability in the price level and the purchasing power of money.

In style of treatment and organization of material, the writer has had in mind to put the discussion in thoroughly teachable form at the college level of instruction. Although this purpose has required constant effort at clarity and precision, nevertheless it has not permitted a juvenile simplification of matters inherently complex and difficult. Having used the bulk of the materials of the book in class-room instruction for some years, the writer has reason to presume that the subject-matter can be made challenging and intelligible to the university student without sacrifice of the essentials and fundamentals of the problem.

In working toward this end, the treatment does not aim to reiterate the bare rudiments of the subject, as these are supposed to have been covered in the introductory course in economics.

For undergraduate courses the context will usually be sufficient; for graduate courses, the use of footnote references and chapter readings will enable a more comprehensive exploration of the subject. For courses in money, most instructors will find a supplementary text unnecessary. For courses which combine money and banking, most instructors will find it desirable to use a supplementary text on the banking side of the material.

The setting of the problems of money, bank credit, and prices has shifted during the past two decades. Most of the American books on such problems were written against a background of greenbackism, bimetallism, and agitation for reform of the National Bank Act. The scene changes in essential respects with the great disturbances of the World War. The modern setting places emphasis upon such factors as the war legacy of inflation and deflation, central bank policy, the position of credit, interest rates, and prices in the business cycle, the use of statistics and index numbers, the gold exchange standard, the international connection of price movements, and the stability of the price level.

These modern issues are of fully as much interest and concern to the man of practical affairs as to the economist and student. It is hoped that the banker, the business man, the legislator, and the administrator may find in this treatment a wealth of significant material. Various popular monetary fallacies and heresies are analyzed; some favorite assumptions in banking circles are questioned; some objectives of monetary reform are critically appraised. Any influence which this work may have on the shaping of public policy and of banking standards in this vitally important field must be reckoned among its most cherished values.

Lionel D. Edie

March 15, 1928

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MONEY, BANK CREDIT, AND PRICES

Chapter I

MONEY, CURRENCY, AND CREDIT

THE modern system of economic activity is aptly termed a money economy. Motivation runs largely in terms of the making of money; calculation of policy runs in terms of gain or loss in money income; wealth and welfare run in terms of money values. The disturbances to economic prosperity are interwoven with the fluctuations of prices and monetary profits; the distribution of property and income is deeply affected by changes in the purchasing power of money; the efficiency of the physical plant and equipment of industry is regulated by exigencies of finance. This phase of economic life is not the only phase, but surely none is more pervasive of all branches and none is more important.

The student of money and prices is not, therefore, concerning himself with a mere isolated fragment of economic science. Rather, he is concerning himself with basic processes which permeate to the uttermost ends of that science and which interrelate themselves with all fields of economic activity. It is well at the outset to realize the intimacy of monetary problems with the length and breadth of modern economic life. It is well to bear in mind throughout the analysis that production, consumption, value, and distribution are saturated with the processes of money, credit, and prices, and that monetary economics is an integral part of the general science of political economy.

The present chapter will outline the structure of the modern monetary order and its origin and evolution.

The Structure of a Modern Monetary System.—On June 30, 1925, the monetary system of the United States contained the following elements:

	Amount	Per cent distribution
Monetary stock of gold coin and bullion.	$4,386,000,000	12.3
Currency, not including gold..........	3,835,000,000	10.9
Demand deposits, subject to check (estimated)	27,189,000,000	76.8
		100.0

The relative distribution of gold, currency, and credit varies considerably from country to country. The United States has a high proportion of deposits subject to check, and in this respect closely resembles England. Most other countries rely relatively more upon note circulation than do these two, but they have in recent years moved in the direction of checks and deposits as a substitute for notes. With these qualifications, the monetary system of the United States may be taken as approximately representative of the systems of most of the advanced industrial countries.

(1) *Gold coin and bullion.*—A distinguished banker is reported to have testified before a congressional committee to the following effect, "There is only one thing which is money, and that is gold." This strict limitation of the term money is permissible, although in common usage the word refers loosely to paper notes and often to bank loans and deposits. Economists themselves are far from agreement as to the limitation of scope of the word. Faced with this confusion of both popular and scientific usage, it is futile to lay down dogmatically a precise definition and to insist upon strict adherence to that definition. The best solution of the difficulty is to refer to gold as the standard money of the country, to other circulating general media as currency, and to bank deposits as credit. When necessary to refer to the aggregate of all these forms, we can employ some such phrase as the total media of exchange. This use of terms may appear somewhat clumsy, but it has the distinct advantage that ambiguity in the use of the word money is eliminated.

Gold is the standard money in the United States and in most other leading countries. All forms of currency and credit are convertible into gold, or, if not actually convertible, are maintained at par with gold by devices known as the gold exchange standard. Thus, by one device or another, the value of all other forms of media of exchange are maintained at a constant ratio with the value of the gold unit. It is the ultimate money of redemption or parity.

The character of the gold monetary unit is defined by statutory law. By an Act of Congress, the dollar is 25.8 grains of gold nine-tenths fine (23.22 grains of pure gold). Under such an arrangement a dollar is a weight unit. The test of a dollar is a test of weight. When we say that any article or service is worth a dollar, we mean that it is worth 25.8 grains of gold nine-tenths fine. When we express the price of any article or service in terms of money, we are merely expressing the exchange ratio between such article or service and some multiple of this fixed weight unit of gold. Accordingly, this unit of weight serves as a unit of account for the whole price system. All reckoning and calculation from the smallest retail purchase to the largest corporate transaction runs in terms of this gold unit.

In order that gold or any other object should function as such a unit of account, it is necessary that it should be generally acceptable in exchange for any other article. The high degree of acceptability of gold is in part an outgrowth of custom and in part an outgrowth of law. Gold is universally desired as an object of adornment and as an object of industrial usefulness. When people endeavor to testify to the merit of an article by declaring that it is "as good as gold," they are tacitly recognizing the fact that the desire for gold is so universal that one can always exchange it for the useful articles which one desires. The force of custom and habit in this respect is buttressed by the provision of law that gold shall be legal tender in settlement of debts. This legal-tender provision requires the creditor to accept gold as settlement in full for any money obligation owing to him.

Although gold has become the preferred standard money of most countries, nevertheless it does not follow that other objects cannot serve the same purpose. Silver preceded gold in the favor of many countries and still retains its place as standard money in a few instances. But it is quite possible to depart from specie entirely in selecting a monetary standard. A paper standard is entirely conceivable. Indeed, most countries during the World War abandoned a gold standard and adopted paper standards. Such paper moneys were originally promises to pay gold to the bearer on demand, but when gold convertibility was abandoned, these promises became ineffective. Of course, there was always the hope that some day the paper moneys would again become convertible into gold, but in extreme cases this hope became so dim as to be negligible. From these war-time experiences, it is necessary to admit that it is possible to have a pure paper money without any reference to specie backing. The unit of account would be a paper certificate, perhaps simply stating, "This is a dollar." If custom and habit induced people to accept these paper counters freely in exchange for commodities and services and if governments declared them to be legal tender, they would serve the purposes of a true money. Banks would use them as reserves, employers would use them to disburse pay roll, governments would accept them in payment of taxes, merchants would accept them in payment for commodities, creditors would accept them in settlement of debt. In this case, the unit of account would not be a fixed weight of gold or of some other commodity, but would simply be the purchasing power over goods in general possessed by a paper counter. A dollar would be not an amount of gold, but an amount of purchasing power evidenced by a paper certificate. It is not being argued that this kind of paper instrument would be a desirable form of money. It is merely being claimed that, whether good or bad, it would at least be real money.

(2) *Currency.*—The currency in circulation in the United States includes gold coin, coin of silver, copper, nickel, or bronze, specie certificates, government notes, and bank notes. Gold coin has become relatively unimportant. The public, as a matter of convenience, prefer substitute forms of hand-to-hand currency. Gold for the most part is stored in the form of bullion and does not enter circulation at all. In the form of bullion, it is stored in bank vaults as reserves or is shipped from one country to another in settlement of international balances. Gold certificates are practically warehouse receipts for gold deposited with the United States Treasury. They certify that a specified amount of gold has been so deposited and that the bearer can exchange the certificate for gold on demand. They are much more convenient than actual specie for circulation purposes. Government notes are illustrated by United States notes, popularly known as greenbacks. These notes are relics of the fiat paper notes issued during the Civil War. They are obligations of the government and are maintained at parity with gold. Bank notes are promises to pay a specified sum to the bearer on demand without interest. Federal Reserve notes are a combination government and bank note in that they are direct obligations of the United States Government, but are actually issued by and are also obligations of the Federal Reserve banks. Silver certificates are warehouse receipts for silver on deposit at the United States Treasury. Silver coin and coin of baser metals contain bullion of lesser value than the nominal amount stamped

on the coin, but are maintained at parity with other forms of currency by limitation of issue and by free exchangeability with gold and with currency.

This heterogeneous system of notes and coins represents many technical differences in currency issue, but it embodies one basic principle—namely, that all forms of currency are freely exchangeable for gold and are maintained at parity with gold. Under all ordinary conditions, they are as acceptable in exchange for goods as gold itself would be. They perform the daily work of hand-to-hand currency, and everyone readily accepts them in settlement of debts. But it should be clearly recognized that nongold currency is not the standard money of the country. It may be backed by gold, convertible into gold, at parity with gold, and a promise to pay gold, but after all it is not the ultimate standard of value. Gold alone is that standard.

(3) *Credit.*—Credit is a promise to pay gold or legal-tender paper currency. The bulk of credit transactions cancel out by the process of clearance, so that actual gold or currency is greatly economized. It is commonly estimated that 90 per cent or more of all transactions are completed by means of credit, without the active intervention of money. However, back of this large volume of credit, reserves of gold and currency are necessary, either as a matter of law or custom, or of both. Since credit is a promise to pay money, banks must keep on hand a certain amount of the thing promised. The cash reserves of the banks support the superstructure of credit and insure that depositors can make good their claims to cash whenever they desire. However, as long as they are confident that cash is amply available, they are not anxious to secure it. Only when confidence is undermined does the public make a run on the banks for cash.

This relationship of credit to cash rests upon a difference in the degree of acceptability of the two media of exchange. The acceptability of credit is closely dependent upon the credit rating of the individual. Checks are not accepted among strangers. Credit instruments in general acquire acceptability only among that limited circle of business men who know something of the character and resources of the drawers and indorsers. The range of acceptability of currency is not so limited. Paper currency and coin are freely accepted in payment for merchandise in all parts of the country, from complete strangers as well as from the best-known citizens. Even in the worst panic, the general acceptability of such currency is not likely to be undermined. Some there will be who will require actual gold, but the bulk of the people will feel secure with any form of cash. Internationally, paper currency has limited acceptability. The only article which enjoys full international acceptability is gold itself. For this reason, gold is used for the settlement of international balances.

Obviously it is possible to build up a hierarchy of the various forms of media, from most acceptable to least acceptable. Gold is the base, currency is the next layer, and credit is the great superstructure. It is important to visualize the relativity of the acceptability of money, currency, and credit.

There is no single, complete measure of a country's volume of credit. However, as a basis for estimating the fluctuations of credit which are most closely connected with commodity prices, demand deposits of commercial banks are a fairly reliable indicator. Such deposits, under the Federal Reserve system, may be withdrawn immediately or at most on less than thirty days' notice. In practice they are always subject to check and can be drawn out at any time by the depositor. Time deposits are not, for most purposes, a good measure of the volume of that form of credit which affects commodity prices. Relatively few checks are drawn against time accounts, and under the Federal Reserve law, notice of thirty days may be required before withdrawal. In many countries, data for demand and time deposits are not separated. The two are lumped together under some such heading as individual deposits. Various classes of loans, discounts, and investments may be taken as measures of credit, although these reflect more the demand for credit than the supply of it. Book credits, charge accounts, and many other forms of credit escape the statistician. Clearly, the problem of measuring the volume of credit permits no simple, definite solution. The kind of measure employed depends largely upon the purpose of the investigator. In the present volume, the most common measure adopted will be demand deposits, since these are of primary importance where the purpose is analysis of commodity price fluctuations.

The Origin of Money.—There is a theory which has acquired the weight of an orthodox tradition that money was an invention to overcome the inconvenience of barter. The well-known view of Adam Smith runs as follows: "In order to avoid the inconveniency of such situations, every prudent man in every period of society, after the first establishment of the division of labor, must naturally have endeavored to manage his affairs in such a manner as to have at all times by him, besides the peculiar produce of his own industry, a certain quantity of some one commodity or other, such as he imagined few people would be likely to refuse in exchange for the produce of their industry."[1] According to this view, the division of labor makes barter so clumsy and laborious a procedure that from sheer necessity men invent money as a means of facilitating trade between specialists.

This doctrine makes of the origin of money a highly rational and deliberate process. It overrates the conscious intent of primitive societies. It sets up a very speculative, imaginary, early state of industry. Studies of prehistoric man fail to throw much light on a pure barter economy; indeed, they leave us to conjure up such an economy by speculative inference. In the earliest forms of society of which we have any definite knowledge, there are certain articles which to some degree already serve in the capacity of a medium of exchange or unit for reckoning values. In the course of day-to-day exchange of goods, certain articles are so generally prized by all members of the community that people are willing to hold them in the confident expectation that at some later time they can be exchanged for articles of common necessity. Often the various mediating articles are graded according to some scale of uses, so that one article will facilitate exchange of one class of goods, another article will facilitate exchange of a higher class of goods, and so on. It is only gradually that one commodity is singled out for exclusive use as money. This slow evolution more resembles the growth of language than the rationalized process described by Adam Smith. Blind custom and unconscious development are salient characteristics of the process.

Evolution of the Object Selected as Money.—A very wide variety of commodities have at one time or another served in the capacity of money. The following classification of money commodities is suggestive:

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[1] Smith, Adam, *Wealth of Nations*, Book I, Chapter iv.

(1) Consumable necessities, such as rice, salt, corn, fish, furs, tobacco, cattle, clothing.
(2) Capital goods, such as knives, nails, bullets, weapons, metals.
(3) Articles of ornament and display, such as shells, beads, gold, silver.
(4) Tokens, such as scraps of fur or paper, used as symbols or counters of purchasing power, but having no exchange value as commodities.

There is no fixed order or sequence of appearance among these commodities. Shells were among the earliest known forms of money, but they have reappeared from time to time in less remote periods. The Colonists in America in trade with the Indians and with each other reverted to commodities, such as furs and grains, which had been utilized by other communities many generations earlier. Gold, which is now the favorite money commodity, was in use many centuries B.C., and in general preceded the use of silver. Hence, it is futile to construct any chronological scheme whereby one age nicely follows after another. The scene shifts from country to country and period to period.

Nevertheless, there are certain landmarks along the way which deserve special consideration. The transition from the Old Stone Ages to the New Stone Ages marked the development of settled community life, the domestication of animals, the development of agriculture, and the more intensive specialization or division of labor. The institutions suitable to the new mode of life constituted a setting favorable to the increase of trade, the frequent exchange of certain articles in most common demand, and the gradual survival of one or more articles as the preferred medium of exchange and unit of account. The transition from the Stone Ages to the Bronze Age was characterized by the introduction of bronze and copper as money commodities. The growth of metallurgy facilitated the use of other metals, such as gold, silver, and iron. Thus, the evolving technology of production opened the way to new preferences and new customs in monetary usage.

In most Mediterranean countries, there was a common emphasis upon the ox as standard of value and to some extent as a medium of exchange. The ox unit seems to have achieved a more widespread vogue in this great basin of ancient civilization than any other monetary commodity. The word *pecuniary* (monetary) is derived from the Latin *pecus* (cattle). When coinage superseded cattle, the specie unit was an ox-worth of gold. The specie unit was that weight of gold, approximately equal to a modern five-dollar gold piece, which was at the ancient period considered of the same value as a cow or ox. The influence of the old money upon the new is an interesting feature of this monetary transition.

Gold was employed as a form of money as early as about 3000 B.C. At first it passed current in the form of bars, rings, or chunks, usually stamped with some insignia of the ruler, and measured by weight or by size. Coinage made its first appearance in about the seventh century B.C. in Lydia. The device spread gradually westward in Europe and came into usage mainly as a result of borrowing a foreign institution. The technique of coinage passed through many important steps of evolution. Private coinage was displaced by government monopoly; the arts of casting, stamping, milling, and designing so as to avoid counterfeiting, made progress; new devices for debasement and for recovery from debasement were resorted to.

Token money appears in both recent and distant times. The modern forms of token money are chiefly subsidiary coin and fiat notes. The subsidiary coins are a semi-token medium, since they contain bullion of some value as a commodity, but their face value exceeds their value as bullion. Fiat notes have come into existence chiefly as a result of major wars. They are promises to pay specie, but as promises they are worthless because specie payments are suspended. Nevertheless, they pass current, serve as the unit of prices, and perform all the work of money. In primitive societies there appeared occasionally prototypes of such token instruments. The instances were comparatively rare, but they are sufficient to show the possibility of a commodity, worthless in itself, serving as a symbol or counter of purchasing power.

Some Factors in the Evolution of Money.—The evolution of money has been shaped by so many different influences that it is difficult to single out the few primary influences of greatest importance. Nevertheless, some outline of the variety of forces at work is helpful in building up an adequate picture of the diversity and complexity of the process.

In a great many of the early societies, money appears to have been used to make gifts before it was used to any significant degree to facilitate trade. Intertribal gifts and offerings as a symbol of peace, interfamily presents and dowries, tributes and ransoms paid by defeated tribes to their conquerors, donations to priests or other religious officials—all of these required the use of articles held in the highest esteem by the recipients. Moreover, money seems quite commonly to have developed in external relations and foreign trade before it developed in internal relations or domestic trade. The possibility of traffic with the foreigner hinged upon the ability to offer a medium of exchange which appealed vividly to his imagination.

War and religion were powerful influences in the development of money commodities. The exaction of indemnities from the vanquished, the hiring of soldiers, the collection of taxes, the financing of invasion of neighboring territories, alike were facilitated by the use of a money medium. Chiefs, princes, and kings encouraged and enforced the adoption of various commodities for such purposes. The general acceptability of a money commodity was often due to its significance for religious sacrifice. The wide vogue of oxen as a money commodity among Mediterranean peoples was in large measure an outgrowth of the great importance attached to the animal for purposes of religious sacrifice. People sought favor with the gods by offering the best which they had. When gold and silver became available, the temples were filled with vessels and ornaments of these precious metals.

To these factors must be added the strategies of law and government. Rulers collected dues in terms of the commodities most esteemed and prized for their use. They engaged without scruple in plunder and pillage among their neighbors. They coerced the foreigner to use money for the purpose of paying tribute as well as for the purpose of carrying on trade. When the foreigner resisted the innovation of a money commodity, his "sales resistance" was forcibly broken down. Unknown lands and seas were explored in the hope of discovering new monetary treasure. Meantime there grew up a framework of law to protect the property rights of those who acquired wealth and treasure. The development of police power, freedom of contract, rights of private property, and security of ownership insured a set of rules and regulations under which the making of money incomes flourished. In its more sinister aspect, this process was marked by exploitation of the weaker classes, by avarice, cupidity, and acquisitiveness. To no small degree, the money institution was forced upon the reluctant masses by the early pastmasters in the art of acquisition.

The predilection for shells, beads, and baubles, and the ultimate adoption of silver and gold as the money medium, suggest the great weight attached to ornament, extravagance, and blandishment in the evolution of money. Although these articles ministered in a minimum to the basic necessities of bodily comfort, they nevertheless captivated the imagination of savage and modern alike. How else could one display his importance in society? The purchase price of a bride, the wedding dowry, the gift to a queen or a temple, the glitter of rare and precious jewelry—these commanded the highest prestige in the community. Conspicuous waste, ostensible extravagance, glaring riches depended upon the blatant show of these scarce articles of beauty.

Permeating all of these influences upon monetary evolution was the process of cultural diffusion. From one or more centers where money originated, the cultural trait spread to the outside world. Independent invention or discovery of the money mechanism was extremely rare. Borrowing of the mechanism, voluntarily or involuntarily, was the most frequent source of its adoption. Local adaptations took the form of substituting commodities of peculiar local importance for those used elsewhere, but the lineage of the new monetary practice as an institution was traceable to preëxisting institutions of similar type in neighboring regions. Travel, conquest, exploration, migration, and mixture of races and nationalities facilitated this diffusion of the money culture trait.

Finally, we must admit some importance to the influence emphasized by Adam Smith, namely, the inconvenience of barter. Unquestionably, this influence was ever present, and made early societies readily susceptible to the introduction of money. Nevertheless, there is a temptation to over-rationalize the thought processes of earlier peoples. Doubtless, the few who sought to break up the folkways of a barter economy by the use of money were viewed with suspicion as dangerous agitators. A vote of the people as to whether money should or should not be adopted is scarcely conceivable. Surely no early social scientists brought barter institutions under laboratory analysis, found them deficient, and forthwith contrived and introduced a new and better institution in the form of money. Rather, unconscious drifting in the direction of quasi-barter and ultimately of monetary exchange played the leading rôle. The inconvenience of barter, supplemented by the multiplicity of other influences, gifts, foreign contacts, war, religion, plunder, politics, private property, conspicuous waste by dominant classes, and cultural diffusion, gives a fairly complete account of the complex origin of money mechanisms.

The Renascence of Money after the Middle Ages.—During the Middle Ages, the feudalistic and manorial economy operated on the basis of self-sufficient local units, the minimum of trade and urban life, and the use of money in only a small proportion of the production-consumption activities of the people. This relapse from the commercial and monetary régime of Rome and Greece lasted until about the eleventh century A.D. During that century, there appeared a renascence of money transactions. The influences accountable for this revival of money are in many respects similar to those accountable for the origin of money in ancient and prehistoric times.

The Crusades stimulated the use of money by giving Europeans knowledge of the relatively advanced coinage and banking institutions of Constantinople and the Orient, by yielding spoils of precious metals which were brought back to Europe, and by opening up trade between East and West and thereby creating a need for financing of shipping and foreign commerce. The growth of foreign and domestic trade, the development of towns and cities, the rise of merchant and craft gilds, helped to undermine feudalism and the mediæval manor. The commutation of payments in kind, such as taxes, military service, feudal labor and rent, and church dues, to payments in money, marked a fundamental transition to a pecuniary order. The financing of wars, the hiring of mercenary soldiers, the support of extravagance and conspicuous waste among royalty and leisure-class nobility, the rise of a *nouveau riche* merchant class, alike fostered and were nourished by the reintroduction of money. Gifts between royal families, ransom and reparations from defeated foes, plunder and pillage in foreign lands, manifested the new fascination for the money commodities, gold and silver. The search of explorers for new routes to the Indies and for new resources of the precious metals bore fruit in the rich discoveries of silver and gold in the New World. The feverish and ruthless exploitation of these mines in the sixteenth and seventeenth centuries poured new specie at first into Spain and thence by degrees into all of western Europe. Thus did Europe acquire an abundant supply of money material at the very time when the mental attitude of the people was most receptive.

During the five or six centuries following the Crusades, the institutions of note issue and bank credit were developed as a supplement to specie money. These institutions had their origin in ancient times, and attained considerable importance in Greece and Rome. Hence, the post-mediæval development of currency and credit was a mixture of borrowing from the past, from survivals of banking in Constantinople and elsewhere, and of independent influences peculiar to the post-mediæval period. The debasement of coinage and the clipping and counterfeiting of coins gave rise in the eleventh century and after to a type of banker whose task was to test the weight and fineness of coin and to exchange the multiplicity of moneys in circulation on the basis of their bullion content. Other institutions grew up for the purpose of safe keeping of deposits of specie for merchants and of making payments at a distance at their order. Loans were more often for political purposes than for commercial, and the most frequent political purpose was the financing of wars. The favorite security was some trade or fiscal monopoly. Small loans and emergency loans were provided by Jews and aliens until the lucrative character of lending lifted the church and social ban on that calling and elevated it to a position of eminent respectability. In some regions banks took over the duty of collecting taxes for cities and states. In England, the goldsmiths received coin for testing or safe keeping. The tickets or warehouse receipts issued to depositors were forerunners of bank notes in the form of gold and silver certificates. Finding that the law of probability insured them against calls for more than a small fraction of their specie holdings on a given day, the goldsmiths issued notes backed by less than 100 per cent of specie and thereby inaugurated the true modern bank note. Simultaneously, there developed such credit devices as bills of exchange, checks, and negotiability. Thus, out of debasement of coinage, money exchanging, deposits for safe keeping, payments at a distance, the needs of trade, political loans, war financing, monopoly collateral, the lending of Jews and aliens, and the collecting of taxes, there emerged modern currency and credit and modern banks of discount, deposit, and issue.

This brief sketch of the post-mediæval renascence of money suggests that the rediscovery of money processes was due to causes much broader than the inconvenience of barter or the needs of trade. The mixture of religious, political, racial, military, and social influences deserves careful attention and more than usual emphasis.

It is perhaps appropriate to set up the hypothesis that if a very wide variety of factors explains the origin of money in prehistoric times, its development in antiquity, and its reintroduction after the Middle Ages, a somewhat similar variety of forces may be shaping the present-day evolution of money mechanisms. The *status quo* in such mechanisms may be thought of as a tentative or transition stage. The dynamic character of money institutions is as pronounced as ever it was, and the student of such matters does well to search for the multiform influences operating to bring about their continuous modification.

Survivals of Barter.—The inconvenience of barter arises from three main characteristics of that system of exchange. First, there is a "want of coincidence" of buyer and seller. The individual who wishes to dispose of wheat and secure clothing must hunt far and wide to find another individual who wishes to dispose of clothing and secure wheat. The development of markets, fairs, and newspaper for-sale or want ads. tends to alleviate this difficulty somewhat, but at best leaves barter a clumsy, slow-moving, and often futile mechanism. The modern possessor of an automobile who decides that he would like to swap the machine for a piano or a plot of real estate will become acutely convinced of the difficulties of barter before he finds the second party necessary to complete the exchange. Second, there is a difficulty in exchanging goods of unequal value. The consumer who wants bread has shoes to offer in exchange. But the amount of bread desired has an exchange value equal to only a fraction of a pair of shoes. The shoes cannot be subdivided without destroying their value. Of course, the shoemaker might strike a bargain with the baker that he will exchange one pair of shoes in return for the right to obtain a loaf of bread daily during the next forty days. But obviously such a makeshift is crude and clumsy. As applied to many commodities, it would be quite futile. Third, there is a difficulty in setting up a scale of prices. Bread has one price in shoes, another in meat, another in transportation, and so on. Under barter, each article must have as many different prices as there are other articles for which it is to be exchanged. In a complex system of production, where many thousands of articles enter the market, the enumeration of exchange ratios or prices of each good in terms of every other good would be utterly confusing. The introduction of a common denominator of prices in the form of money obviates this difficulty and makes possible a scale of prices that is relatively simple and understandable.

The presentation of the difficulties of barter must not, however, be allowed to give the impression that barter is wholly obsolete. Too often barter is thought of as a condition appropriate to a state of savagery, but totally unfitted to a state of civilization. In fact, however, the survivals of barter in modern economic life are numerous and not unimportant. Indeed, barter, far from being the most difficult, is often the most convenient form of exchange in present society.

Consider, for instance, the farmer who takes butter and eggs to the country store, and instead of receiving cash payment trades out his produce for groceries and clothing. He participates in an exchange which may be more beneficial both to himself and to the storekeeper than would a cash transaction. The farmer obtains an outlet for his produce, and an exchange ratio more favorable than he could obtain by a cash sale. The merchant can procure the farmer's commodities by offering goods which were purchased at wholesale prices but which are exchanged at a ratio determined by the usual retail mark-up. Nor is this process confined to rural trade. A life-insurance salesman sells a $10,000 policy to a clothing merchant, and trades it out. The insurance salesman receives his usual commission on the sale and obtains clothing which he would have had to obtain anyway at prices no higher than he would otherwise have paid. The merchant makes a profit on the clothing, and obtains insurance at standard rates. The transaction is mutually profitable, but no money changes hands as between the two parties. These illustrations suggest that "trading it out" is a barter survival which still has some importance.

Another class of barter survivals may be referred to as "trade-ins." The owner of an old automobile trades it in toward a new one. The difference between the value of the old and the new car is settled by a cash payment, but the rest of the transaction involves no exchange of money between the two parties. This device is employed in the great majority of present-day automobile sales. Similar practices are common in the furniture trade. Also, they are frequent in real estate and building. Contracts are made whereby the purchaser turns in a parcel of real estate or an old house and lot toward the purchase price of a new home, the difference alone requiring a monetary payment.

Of course, in all such survivals of barter, money intervenes in the sense that it is used as a unit of account. Suppose that the price of a new automobile is $2,000 and the purchaser is allowed $1,000 on his old car. The barter ratio is one new car to two old ones, but it is more convenient to express this ratio in money terms than in barter terms. Perhaps such transactions should be designated by some such term as quasi-barter. Money is used as a means of price calculation because that is the best device for stating the barter ratio, but money is not used as a medium of exchange.

Illustrations of barter or quasi-barter could be multiplied at length. The swapping of livestock among farmers, the remuneration of farm labor by granting the employee board and room, the exchange of advertising space in small newspapers for theater tickets or rights to hotel accommodations, the offer to exchange agricultural implements for a specified number of bushels of corn, the payment of reparations in kind by vanquished nations, the reversion to barter in post-war Europe when currency inflation became extreme—all these are cases in point. The services of housewives in management of household affairs are a form of labor rendered without direct payment in money wages. It has been estimated that such labor, if evaluated at current wage rates paid domestic employees, would have amounted in 1919 to more than $18,000,000,000. This was more than a fourth of the money income received by all individuals of the United States during that year. To this should be added an estimate of about $4,500,000,000 for articles grown on American farms and directly consumed by farm families without any resort to purchase and sale. Another $2,500,000,000 should be added as an allowance for commodity income from family gardens and livestock received by town and suburban residents and for rental of homes occupied by owners. Some allowance must also be made for the fact that more than one-fourth of all farms in the United States are cultivated by tenants who pay as rent a share of the produce.[1]

Such a summary of survivals of barter indicates that trade and service without the use of a monetary medium of exchange are too important to be excluded from consideration. The barter device is a supplement to the money device in modern commerce. Money has by no means completely displaced direct exchange of goods for goods, although it has of course greatly outstripped direct exchange in relative importance. A proper perspective upon the position of barter survivals in the modern money economy is indispensable if one is to understand broadly and adequately the manner in which money functions in contemporary economy society.

Development of the Modern Money Economy.—Although the roots of present institutions reach into the prehistoric past, nevertheless we have a deep interest in their less remote developments. The capitalistic system in advanced form is a comparatively recent development. Save for a few earlier manifestations of some of its characteristics, capitalism is scarcely a century and a half old. It began to take on its modern characteristics when the industrial revolution occurred at the end of the eighteenth century and the beginning of the nineteenth. The new economic order elevated money to an importance never before attained. So dominated is this order by money phenomena that it is properly referred to as a "money economy." One of its most distinguishing characteristics is the fact that *the essence of business strategy and of individual industrial activity consists of the making and spending of money incomes.* It is true that money serves as a medium of exchange and as a unit of account, but these services are incidental to the main motivation of economic life, which centers around the acquisition of gains in money income and the expenditure of money income for the commodities and services required in consumption.

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[1] See *Income in the United States*, National Bureau of Economic Research, vol. i, p. 58; vol. ii, p. 231; also *United States Census of Agriculture*, 1922, vol. v, p. 124.

Around this trait of the money economy cluster many auxiliary traits. Corporate management, joint stock ownership, limited liability, stock markets and money markets, property rights, security of ownership, freedom and sanctity of contract, constitute a framework of ownership and control of the resources out of which money incomes are derived. The prospect of money profits guides the managers of this framework in all phases of business policy. Prices of many classes of goods and services are interrelated and constitute an orderly system of pecuniary accounting. The margins between cost prices and selling prices give the money gains for which business strives. The shares distributed to land, labor, and capital are a flow of money payments. The well-being of the common man depends largely upon the ratio between his money wage and the prices of the articles which he consumes. These are very brief suggestions of the character and scope of the money economy. As one writer has said, "In the modern world industry is closely enfolded in a garment of money." [1] If the reader will bear these observations in mind in the following chapters, he will have a key of interpretation which will be of great value.[2]

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[1] Pigou, A. C., *Industrial Fluctuations*, 1926, p. 117.

[2] This conception of the money economy is so briefly stated as to be merely suggestive of the nature and scope of that bundle of pecuniary institutions. For a more adequate statement, see Mitchell, Wesley C., *Business Cycles, The Problem and Its Setting*, 1927, ch. ii. Also see Edie, L. D., *Economics, Principles and Problems*, 1926, chs. x and xiii.

Chapter II

THE FUNCTIONS AND QUALITIES OF MONEY

MODERN business makes certain requirements of its monetary mechanism. Gold, currency, and credit are called upon to perform definite functions and to possess numerous qualities essential to those functions. The work which money has to do and the qualities which money must have to meet the requirements of business are the main subjects for consideration in the present chapter.

The Functions of Money.—One of the chief uses of money is as a medium of exchange. Instead of exchanging goods for goods, we exchange goods for money. But the money is not an end in itself; we seek it only because it will give command over other goods which we desire. At some future time, we exchange the money for goods. Ultimately and indirectly, therefore, we exchange goods for goods. Yet the "want of coincidence" which was the chief stumbling block of barter is completely eliminated because the buyer always has a medium which is universally acceptable to sellers.

Since money is a go-between in this ultimate exchange of goods for goods, many have assumed that the rôle of money is merely nominal and superficial. Such an assumption is highly deceptive. When money intervenes, the physical exchange of goods is regulated by the money-spending process. The motive of producers is to obtain the money of consumers. The strategy of consumers is to spend money effectively. Those who have goods to sell are obliged to concentrate their effort upon persuading those who have money to spend to part with their money. Sometimes the money spenders will want one thing, sometimes another. Sometimes they will spend lavishly, sometimes frugally. The shifts in spending make or mar the fortunes of business enterprise. The introduction of a vast floating fund of purchasing power which can be mobilized now in one direction and now in another is wholly outside the horizon of a barter economy.

The objects serving as a medium of exchange vary from stage to stage of a country's history. When the United States first adopted a gold standard, gold coin was rather widely used as a circulating medium. Now it is very slightly used for that purpose. In most countries of Europe, gold has been entirely withdrawn from circulation and has been concentrated in the reserves of central banks. Hence, gold has ceased to have importance as a hand-to-hand circulating medium. The actual media are subsidiary coin, paper currency, and bank credit. Bank credit is about nine times as important as all other media combined in carrying on the total trade of the United States. Nevertheless, gold is not unimportant merely because it is stored in bank vaults. It is available for export in settlement of international balances. It functions as a reserve for the actual domestic media and sustains confidence in the actual media. It regulates and stabilizes the supply of other media. It embodies the standard of value in terms of which all other media must be maintained at parity. It is a potential medium whenever fear or panic seizes any part of the credit mechanism. Thus, in manifold ways, gold is of basic importance to currency and credit, even though gold itself is a negligible part of the circulating medium.

A second function of money is to serve as a standard of value. Ratios of exchange are established between gold and all other goods and services. In order to ascertain the exchange ratio between two or more commodities, it is necessary merely to compare their respective exchange ratios in terms of the common standard, gold. In ordinary activity, exchange ratios are expressed as prices. The price of a commodity is the number of units of gold for which the commodity will exchange. In final analysis, therefore, when we declare money to be a standard of value, we mean that it is a device for reducing exchange ratios to a common denominator and thereby measuring and comparing the prices of all goods and services. The standard of value is a measuring-stick of prices.

One test of a good standard of measurement is constancy. Other sciences are particularly careful to set up units of measurement which will be invariable. For instance, the unit of length is the meter, which is the distance between two transverse lines on a bar of platinum-iridium at the temperature of melting ice preserved in a glass case at the Bureau of Standards in Washington. A yard is 3600/3937ths of a meter. A kilogram is the mass of a piece of platinum-iridium preserved at the Bureau of

Standards in Washington and intended to represent the exact mass of one cubic decimeter of distilled water at four degrees Centigrade. One degree Centigrade is the one-hundredth part of the difference between the boiling and freezing points of water under a given atmospheric pressure. A calorie is the heat required to raise the temperature of a gram of water from 15 degrees to 16 degrees Centigrade. Electrical units of measurement, such as the volt, the watt, the ohm, and the ampere, are so defined as to approximate invariability. The purpose in assigning a given magnitude to any of these units seems to be first and foremost to achieve as nearly as possible absolute stability and constancy of the unit.

The gold monetary unit resembles other absolute units in the sense that it is defined as a fixed weight of gold. However, this fixed weight of metal has an unstable exchange-ratio with other goods. It varies in value with every change in the general purchasing power of money. Judged by the test of constancy, therefore, the gold unit is not a true standard of measurement.

Definition of the gold unit in terms of weight is confusing because it focuses attention on a mere physical fragment of metal and obscures some larger aspects of the nature of the unit. It is possible to have a standard unit of value such that the weight of the unit is wholly irrelevant. This condition is fulfilled in the case of paper standards. For instance, it was fulfilled in the United States from 1861 to 1879 when paper greenbacks were the unit for settlement of debt; or again, in European countries during and after the World War when paper money was the ultimate means of payment. Let us suppose that under a paper standard a piece of currency is given a certain name, such as a dollar or a mark. Let n equal the number of units or pieces of such means of payment. Then the total means of payment of the community will equal n dollars. This expression will describe the total money-spending power. The unit of spending power will be that amount represented by the expression $1/n$ That is to say, the unit will be the nth part of the total stock of ready purchasing power held by the people.

The same considerations apply when gold is the unit of account. In visualizing the nature of the gold unit it is a matter of indifference whether one takes gold pieces alone or all forms of money, currency, and credit. All forms of the means of payment must have an equal value, since by the terms of the gold standard all forms are maintained at parity with gold. It comes to the same thing whether we think of the unit of account as a fractional part of the sum total of gold alone or as a fractional part of the sum total of gold, currency, and bank deposits. The expression $1/n$, where n equals the number of counters of gold, must equal $1/n$, where n equals the number of counters of gold, currency, and deposits combined, since by definition under the gold standard equality of value is maintained between the counters whether they are in one form or another. According to this analysis, the significant feature of the gold standard is the manner in which the number of pieces of the means of payment is determined. The fixed weight of the gold unit is significant because it determines the number of tokens that will be derived from the total stock of gold money, and the number of gold tokens in turn limits the number of pieces of currency and credit that can be circulated on the gold as reserve. The number of pieces of the total means of payment is the real clue to the character of the monetary unit itself. If this number be limited in such manner that the purchasing power of a unit of money is fairly constant, then the unit is a true standard of value, no matter whether it weighs much or little on the scales of the mint. If this number be not so limited, and if the purchasing power of a unit fluctuates sharply, then the unit is not a true standard of value, even though its weight does not vary by the thousandth part of a grain.

The virtue of the gold unit is not that it is a perfect standard, but that it is less susceptible of ignorant or malicious abuse than alternative units. If gold has been at times unstable in value, paper standards have been vastly more unstable. Relatively, therefore, gold has a closer approximation to stability of value than any rival form of money. But this relative advantage in favor of gold should not blind the student of monetary affairs to the flaw of gold itself as a unit of account. This flaw arises from the false notion that a gold dollar is always a gold dollar because it always weighs the same. Only when the notion is grasped that the weight of the unit is significant chiefly in so far as it determines the number of pieces of the means of payment, is one in a position to conceive clearly and definitely the meaning of the phrase, standard of value.

The third function of money is to serve as a standard for deferred payments. Whoever borrows funds today agrees to pay back a specified number of dollars at some future date. Whoever purchases goods today and settles for them at a later date obligates himself to pay a specified number of dollars at that date. The main part of business consists of such contracts, bargains, and debts, involving future or deferred payments.

If the purchasing power of money changes in the meantime, then money is a standard of deferred payment, *of unstable value.* Suppose A agrees to pay B $10,000 at the end of two years. Suppose that in the interim the purchasing power of money doubles, so that at the end of the period $5,000 will buy as much goods as $10,000 at the beginning. Disregarding the interest factor entirely, we find that when the debt is paid the lender will receive the same number of dollars as he loaned, but twice the purchasing power. Consequently there will be a wholly unmerited bonus to the lender matched by a wholly unmerited loss to the debtor. The debtor borrowed dollars of small purchasing power and returned dollars of great purchasing power. Obviously money has acted as a fluctuating standard of deferred payment. It has worked grave injustice between debtor and creditor because its value is inconstant. It has been an imperfect standard and has fallen short of the constancy which is expected of a true standard.

It is conceivable that this defect might be remedied by stabilizing the standard. One possible method would be to stabilize the general level of prices and so to guarantee that when the debtor pays back the same number of dollars as he borrowed he shall automatically be paying back the same purchasing power. Another possible method is to alter the terms of the original contract so that the debtor in the contract itself would obligate himself to pay back, not the fixed number of dollars, but the sum whose purchasing power at the date of maturity would be equal to the purchasing power of the original number of dollars borrowed. Without going into a discussion of either plan, we may observe that by either one of these methods the standard of deferred payment would be a true standard in that it would be constant and stable.

A stable standard of deferred payments takes on special importance in the modern money economy because the time element is so universally important. Bargains, contracts, debts all look to the future. The bulk of business involves credit, and credit is a promise to pay later on. Hence, a means of deferred payment is everywhere required. If this means is shifting and uncertain in its value, this fact increases the risks and hazards of enterprise, disturbs the equitable relations of money incomes of different classes, and restricts the efficient functioning of the whole economic system.

The fourth function of money is to serve as a store of value. The average size of an individual's holdings of pocket currency, checking accounts as represented by demand deposits at the bank, and gold reserves back of such currency and deposits may be taken as an approximate indication of his use of money as a store of value. Everyone requires a certain stock of ready purchasing power on hand to meet the contingencies of the day. This stock will be a kind of revolving fund, since new current receipts will be poured into it and new current expenditures will be drawn out. On the average a certain sum will be found adequate to enable an individual to pay all bills regularly coming due and to meet unforeseen emergencies. If a man receiving $8,000 income annually keeps on the average total funds amounting to $400 in pocket, in bank deposit, and in gold reserve back of these, then his demand for money as a store of value is equal to 1/20th of his income. By a day-to-day account which averages $400 he can make all necessary disbursements. His use of money as a medium of exchange will be represented by $8,000, and his use of money as a standard of value and of deferred payments will likewise be represented by $8,000; but his use of money as a store of value will be represented by $400.

There is much popular misunderstanding of the question, How much money should a person keep as a store of value? There is a popular notion that a man wants all the money he can get. Some have claimed that money is the one thing of which a man can never have enough. Superficially it looks as if the millionaire and the billionaire have unlimited desires for money, but these notions confuse money with wealth and income. The thing desired is wealth and income; and the mere fact that these are measured in terms of money labels should not lead us to suppose that money is the thing desired. The intelligent individual wants money only that he may later spend it. The seeming paradox is that we want money in order to get rid of it. As long as the money is in our hands it does us no possible good. It is an idle asset. It earns nothing, neither rent, interest, wages, nor profit. Only when we spend or invest it do we receive benefit or gain. If we buy a bond, the money ceases to serve as a store of value and the bond serves in that capacity. The bond is a superior store of value because it is an earning asset. Whoever buys real estate or any form of valuable property has a more profitable store of value than money offers. Consequently the rule may be laid down that every prudent man should keep just as little money in pocket and in bank as possible. Everyone should scale his monetary store of value down to the minimum. Some store of value he must keep in order to make day-to-day payments, but the smaller the store of value the better. This is obviously true of the multi-millionaire as well as of the common laborer, in spite of the seemingly insatiable appetite for money. In reality, the rich man converts money as rapidly as possible into profitable investments or into various forms of enjoyment. His mounting fortune is not held as idle money in the bank, but is put out in business enterprise. His demand for money income and for wealth measured in terms of money may be without limit, but the less actual money he finds it necessary to keep in store of value form, the quicker he multiplies his resources and reaches his ultimate goal of becoming well-to-do.

The danger against which every shrewd seeker of gain will guard himself is the danger of having too much money. He has too much money whenever he has surplus idle funds in pocket or in bank which could profitably be invested or otherwise spent to advantage. He is overdoing the use of money as a store of value whenever he could manage his budget by keeping a smaller proportion of his total receipts and expenditures in the form of money. In essence the store of value is hoarded money. His strategy as an economic calculator is to dishoard as completely as possible and to place as large a fraction of his resources as possible in forms of property that yield net returns.

Thus far the idleness and unprofitableness of a money store of value have been stressed, chiefly from the standpoint of the individual. There is another disadvantage of equal moment, namely, the risk that money will deteriorate in value while it is being held. This risk is the greater because it is not always obvious. Let us assume that a man places $1,000 of gold in the best bank vault in the country, where moth and rust will not corrupt and thieves cannot break through and steal. He leaves it there for five years. In the meantime the general level of prices increases 100 per cent or, what is the converse, the purchasing power of money falls one-half. At the end of the period he draws out the thousand dollars. It weighs the same as when he put it in, feels the same, looks the same, is the same. And yet its value, that is, its purchasing power over goods, is only one-half the original amount. He endeavored to store value and protect it to the limit against loss; yet through a change in the purchasing power of money the gold store of value deteriorated and depreciated one-half even while it was locked impregnably behind walls of steel and concrete. The best bank vaults in the world are no safeguard of the store of value when prices in general rise. Hence, whoever treats money in any form as a store of value is a speculator in the trend of prices. The hoarder of money is automatically robbed whenever the cost of living advances. The holder of an unnecessarily large sum of currency and bank deposits is forced to lose whenever the purchasing power of money depreciates. Money is, therefore, an imperfect store of value, not only because it is profitless as long as it remains unspent, but also because it is dissipated by every fall in the purchasing power of money.

Although the foregoing discussion draws attention to some imperfections of money as a store of value, it must not be allowed to give the impression that money, even in this imperfect form, fails to facilitate trade and industry. The work of the world requires that a certain proportion of our resources be kept in the form of a stock of ready spending power. In spite of the shortcomings of money, it serves an indispensable function in such matter as to enable the work of the money economy to be carried on.

A fifth function of money and a corollary to the fore-mentioned functions is to stabilize the unit of account. This function involves especially stabilizing the standard of value and the standard of deferred payments. Money as a store of value will automatically be protected against that form of loss which arises from depreciation of the value of money as soon as its value is stabilized. The money economy operates most advantageously when the value of money is not subject to serious fluctuations. Prosperity is less transitory; distribution of income between labor and other classes is more satisfactory; the relations of creditor and debtor are more equitable.

It must be understood that stabilization is a relative term. Absolute stagnation in the value unit is unthinkable. Some room for restlessness and dynamic movement there must be. The extremes of instability are found in fluctuations such as those of the World War, when the value of money fell one-half or more in a year, or even in a day. The gold standard is in between these extremes. As it has operated in the past, it has not provided as much stability as desired. However, it has been so much better than any fiat paper money ever experimented with that relatively it has a good record. This is not to deny that eventually fiat money may become more perfectly understood and may possibly provide a better standard than gold; nor is it to deny that gold itself may become a kind of fiat money in that its value may not be left to automatic fluctuations in supply and demand but may be subjected to definite control by banks and governments.

In business and banking circles one often finds a certain blind adoration of gold. It is said that a gold dollar is always worth a dollar. This tautology is, of course, true, because as a matter of definition a dollar is defined as a certain weight of gold. But such a statement entirely misses the significant feature of money. The significant thing is that money should always be worth approximately the same amount of the necessities and comforts of life. The gold dollar is not the same dollar, even though it weighs the same, if at one time it buys twice as much as at another. The notion that a dollar is always a dollar gives rise to a false sense of security under the gold standard. It is of fundamental importance to face squarely the proposition that the gold standard does not automatically provide a true standard unit of account; and that if it is to provide this highly essential function, gold must be subjected to more scientific control and regulation in the future than in the past. The various possible methods for accomplishing this objective will appear in subsequent chapters.

The Qualities of a Good Money.—The qualities and characteristics which are required of money are briefly sketched in the following paragraphs. The discussion refers to qualities supplied by currency and credit as well as by gold. The enumeration of the qualities of money is adapted, with many modifications to suit modern conditions, from *Money and the Mechanism of Exchange* (1875) by W. Stanley Jevons.

(1) *Utility.*—Most commodities used as money were in demand as articles of consumption or production before their employment as money developed. Various authorities have contended that the requirement of a good money is utility for some nonmonetary purpose. It is contended, for example, that gold is a good standard money because it is an object of desire for its own sake. The metal is widely used in the industrial arts and has a great variety of nonmonetary employments.

Starting with this observation, some have claimed that a good money has "intrinsic value." The phrase is misleading, since value, *i.e.,* value in exchange, expresses a ratio of exchange between two commodities and is not intrinsic in either one taken separately. Of course, gold has certain intrinsic qualities which lead people to desire it and which give rise to its utility, but a value ratio does not exist until a comparison is made with some other commodity. Hence, gold and other goods have intrinsic qualities which underlie value ratios; but it is a misuse of terms to state that gold or any other goods has intrinsic value. Nor is this fine distinction in use of terms a mere quibble on words. If we think of gold as having intrinsic value, then we naturally infer that anything which happens on the outside cannot affect that value. If the value is intrinsic, then extrinsic conditions are quite unrelated to the value of gold. But once it is seen that the value is not intrinsic, the blind faith in gold as an absolute unit of value ends, and we are faced with the realization that the value of gold depends upon monetary policies on the part of banks and governments and upon fundamental changes in the supply and demand of the metal.

In the monetary system of the United States the bulk of the medium of exchange has no demand for nonmonetary purposes. For instance, the commercial value of paper pulp is quite irrelevant to the purchasing power of paper currency over goods. Likewise, the bank deposit slip and check book have a paying power quite independent of the intrinsic qualities of the material out of which they are made. Only in the case of subsidiary coin does the material have a nonmonetary demand, and here the value of the metal as bullion is always less than its value as money. Hence, practically the whole actual medium of exchange has paying power for reasons entirely dissociated from the nonmonetary uses of the commodity employed.

But it is still possible to claim that the standard money, the money of ultimate redemption, must have utility as a commodity. As a matter of historical development, there seems to have been a tendency for nearly all moneys to emerge from commodities which had originally a very high utility in nonmonetary uses. For instance, basic necessities of life or highly desirable ornaments were favored forms of money. But in modern monetary systems the line of development is in the direction of a lessening of the relative importance of the nonmonetary demand and an increase in the relative importance of the monetary demand. It is possible that this development will lead eventually to the preference for pure paper standards where utility of the money for nonmonetary uses is practically zero. Although this is a possibility, the writer is not setting it up as a desirable goal or as a project worthy of approval. It is simply mentioned as a possible trend of development. But if gold is retained as the standard, we need to face the fact that the use of the metal in the arts is only one factor in determining present-day price levels. In order to trace many of the most important movements of prices we need to ignore the consumption of gold in the industrial arts and focus attention on credit and paper currency which have no commercial value in the arts.

(2) *Portability.*—The precious metals outstripped other commodities in monetary preference because they had great value in small bulk and were therefore easily carried from place to place. Portability is a matter of relativity. Silver is more convenient to transport than oxen or iron, but it is less convenient than gold. Gold in turn is much less convenient to transport than paper currency, and paper currency is less convenient than checks, drafts and bills of exchange. Before the use of bank notes and bank credit became universal, gold and silver coin had to be used for most transactions, and it was natural that men should be interested in the portability of such metals. The development of banking, however, has shifted the problem greatly. For the purpose of shopping around at retail stores, paper currency and subsidiary coin are reasonably satisfactory. However, even more convenient is a charge account, an arrangement to pay monthly bills by check on a given date. Gold has almost entirely disappeared from retail merchandising. After the World War the United States Treasury

endeavored to put silver dollars into circulation, but people found the weight of the coin inconvenient and refused to use it. In the great mass of wholesale and industrial transactions, portability of the medium of exchange is a matter of the use of credit instruments. In order to settle a $100,000 debt, one would need to carry approximately a 300-pound sack of gold or an 11,000-pound sack of silver.[1] How much easier it is to leave gold in the bank and to draw a check. Although custom was gradually eliminating gold from circulation before the World War, nevertheless the process was brought to a swift conclusion as a result of the War policies of practically all governments in withdrawing gold from circulation. Today fully three billion dollars of gold are concentrated in the central reserves which, if pre-War habits were to prevail, would be in circulation. There is little likelihood that gold will again become a significant circulating medium. Its functions will chiefly be performed while the gold is held in reserve or shipped between banks in bullion form.

For very large payments paper currency is not as convenient as checks or drafts. An obligation running into millions of dollars would require clumsy bales of bank notes. The inconvenience is severe under ordinary conditions, but it becomes grotesque when prices rise to extremes. For instance, in post-War Europe when the mark, the rouble, and the crown rose to dizzy heights, huge bundles or truck loads of paper notes became necessary to settle even small transactions.

In a well-organized banking system, gold indirectly serves the requirements of portability by the process of clearance. For instance, a gold settlement fund in Washington, D. C., operated by the Federal Reserve banks, contains about $600,000,000 in gold. Through this fund the annual clearance of payments between the twelve Federal Reserve banks amounts to more than $110,000,000,000. If there is a net excess of debits or credits between any two Federal Reserve banks, the excess is settled by simply changing title to the gold in the gold settlement fund. A bookkeeping device eliminates entirely the physical transportation of the metal. In international transactions most of the payments cancel out by a process of clearance. However, there is some residue of net difference which must be settled by the shipment of gold bullion. Probably the gold bullion shipped amounts to considerably less than five per cent of the total of international payments. The shipment of this residue, however, is a costly process. To ship $1,000,000 from New York to London costs in the neighborhood of $500. This cost is made up of the loss of interest, express charges, insurance and abrasion.

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[1] At market values as of December, 1927.

To summarize the situation, originally the portability of gold and silver was of great significance. Under modern conditions, however, payments at a distance are for the most part made by substitutes in the form of currency or credit. Only the net differences have to be settled in terms of specie, and these net differences have been reduced to relatively small proportions.

(3) *Durability.*—A money should possess qualities of non-perishability. Otherwise its use as a store of value results in rapid deterioration and loss to the holder. Gold is one of the most durable of goods. The only important flaw in its durability is abrasion. When gold was freely used in hand-to-hand circulation, it was estimated that about 0.2 per cent of the world's stock of gold money was lost or wasted by abrasion annually. Applied to present gold stocks, this ratio would mean an annual disappearance of about $20,000,000. However, when the gold is concentrated in bank vaults and is not moved from point to point, the loss and abrasion are practically zero. The only abrasion that now occurs is due to the shipment of bullion between countries, and even here the amount is not serious. Consequently, under the present monetary structure gold bullion has a very high durability.

The durability of paper currency is, of course, small. It quickly wears out or becomes mutilated and soiled. The United States Treasury has estimated that the average life of a dollar bill is less than one year.[1] Many experiments have been tried and are still carried on to produce paper of better quality for currency purposes. Fortunately, the paper currency is easily replaceable, and whatever shortcomings paper units may have on tests of durability are largely offset by their ready replaceability. Much the same observation holds true of the use of checks. Ordinarily they have only one or two uses before they are canceled. The only requirement is a reasonably good quality of paper. Consequently, viewing the modern monetary structure from the standpoint of durability, we find a rather satisfactory situation. The actual media of exchange are low in durability, but are so easily replaced that this is not a serious issue. The durability of gold is ideally achieved because of the withdrawal of the metal from active circulation.

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[1] See *Annual Report of the Secretary of the Treasury*, 1924, pp. 38–43. The life of bills of larger denominations is somewhat longer. A dollar bill costs 1 7/10 cents to manufacture and keep in circulation, and the replacement of unfit and mutilated bills requires the production of about 48,000,000 new bills of one-dollar denomination each month. After the War, the Treasury for the purpose of economy sought to substitute silver dollars for dollar bills, but the effort met with very limited success.

(4) *Homogeneity.*—A money commodity should be of uniform quality throughout, so that equal weights will represent equal values. Pure gold is uniform in quality and structure in all countries and at all times. The metal can be reduced to a standard fineness, and later, if desired, repurified. This homogeneity of gold makes it especially well fitted to settle international transactions.

Paper currency secures the quality of uniformity by the adoption of standard sizes, colors, designs, and textures of notes. Although the United States has seven different forms of paper currency in use, all are, nevertheless, maintained at parity with gold and with each other; and to the ordinary person there is no distinction in their acceptability. Uniformity in the use of checks is obtained through the use of a standard form for writing the order to pay.

(5) *Divisibility.*—The money commodity should be susceptible of division into small pieces for purposes of coinage, and of division into bars of bullion for purposes of storage or shipment. The precious metals readily lend themselves to this treatment. They can be cut up into small portions without loss of value. In this respect they stand in sharp contrast to such a commodity as cattle, which could not be divided without destroying the value of the material. Moreover, the pieces can be reunified by melting coin and converting the metal into bullion form. This process does not destroy the value of the material. Here again the contrast with such a commodity as cattle is apparent, since division and reunification of cattle is unthinkable.

Paper money is easily divisible by the process of stamping different denominations on the surface of the notes. Checks are easily divisible by the process of writing any specified amount upon the face of the check. Thus the modern monetary system achieves highly satisfactory divisibility by the combination of credit, currency and specie.

(6) *Cognizability.*—A good money medium should be proof against counterfeiting or mutilation. Coins made from precious metals are protected from clipping and mutilation by the process of milling the edges and stamping the faces of the coins. Since gold coin has largely been withdrawn from circulation, cognizability of specie has become chiefly a problem of testing the fineness of bars of bullion and estimating their value by weight. Paper currency is protected from counterfeiting by the use of a secret process in the manufacture of paper, or of a secret design or pattern worked into the paper, or of a special texture in the paper. In spite of these safeguards, modern counterfeiting has found numerous ways of imitating official currency. The ingenuity with which bills can be split through the thin edge or lower denominations raised to higher, or the whole structure of bills reproduced, is remarkable. Banks are constantly on the alert for the appearance of counterfeits, and the clerks in the larger banking institutions acquire an almost uncanny skill in detecting counterfeit bills while they are counting currency. The imitations of standard currency are still sufficiently frequent to require the alert and constant activity of the Secret Service. The protection of checks against fraud and forgery also presents some difficulty. There are certain patented devices for perforation of checks so that the amounts cannot be raised. There is a technique for the proper writing of a check so that there are no blank spaces available for fraudulent insertion of amounts or names. However, constant precaution is necessary on the part of all bankers to prevent fraud in the use of checks. A considerable body of laws and judicial decisions has grown up to decide who must assume the loss in case a check proves to be bad. As a general observation we may note that the problem of cognizability has gradually shifted from the necessity of recognizing good coin to that of recognizing good paper notes and good checks.

(7) *Elasticity of Supply.*—A good money should expand and contract in quantity in conformity with the changing needs of trade. It should possess an elasticity which enables its quantity to grow over long periods of time at a pace commensurate with the normal growth of industry. It should adjust itself in volume to the seasonal requirement of business and to the requirement of the business cycle. Morover, it should adjust itself to the extraordinary requirements of such a period as a great war.

Gold is by no means an ideal money when judged by this test. It does not fluctuate over short periods of time, to meet either seasonal, cyclical, or abnormal demands. It does fluctuate over long periods of time by a gradual process of accumulation, but the rate of such fluctuation has usually been either more or less than the actual requirements of business. The result has been long-time periods of rising or falling prices. Paper currency and bank credit are capable of short-term changes in quantity, but there are many difficulties in setting up a mechanism of control which will insure that elasticity does not run to dangerous lengths. These difficulties will be discussed in later parts of the present book. In no form of the medium of exchange yet discovered is the automatic elasticity of supply satisfactory. The whole question of elasticity goes back to the importance of having a stable unit of value. Stability of value in turn depends upon the manner in which the supply adjusts itself to the demand. The problem of stability of value and elasticity of monetary supply is the chief subject of monetary economics, and it will be found that the issue appears and reappears in practically all phases of the discussion of the subject.

Conclusion.—We have seen that business requires and expects certain functions and qualities from money. The manner in which these functions and qualities are supplied undergoes a process of evolution. In the modern money economy the manner in which they are supplied is closely related to the variety of elements in the monetary structure in the form of credit, currency, and specie. The gold standard does not automatically insure that the functions and qualities of money will be properly supplied. We are, therefore, faced with the constant necessity for improving our means of control of all elements of the monetary structure.

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Chapter III

THE GOLD STANDARD: ORIGIN, DEVELOPMENT, OUTLOOK

Early Problems of the Monetary Standard.—The joint use of gold and silver coin appears as early as the sixth century B.C. The ratio of silver to gold at this period was approximately 13 1/3 to 1. During succeeding centuries down to the Roman Empire the ratio fluctuated from a lower point of about 9 to 1 to an upper, of about 15 to 1. Throughout the history of ancient nations, governments apparently vacillated from bimetallism to monometallism without always being aware of how or why the transition took place. There were frequent alterations in the size of the unit, the denomination of the coin, the mint ratio between the metals and their commercial or market ratio. In the Roman Empire gold gradually supplanted silver, and by the end of the fifth century A.D. the Empire was on practically a single gold standard.

Throughout the Middle Ages the history of the money standard shows changes of revolutionary nature. Coin became underweight because either of wear or of clipping, and the poorer coin drove the better coin out of circulation. Rulers resorted to the debasement of coinage by changing the denomination of the coin or by changing its weight and fineness. Other rulers attempted to reconstruct the coinage by recoining metal and putting new money into circulation. Their efforts were usually met by the annoyance of seeing the good coin quickly disappear from circulation. The ratios at which gold and silver were coined were frequently altered, and the ratios at which they exchanged in the market were just as frequently changed. Neighboring countries established different mint ratios and the discrepancies resulting therefrom tended to make some countries which were normally using two metals operate actually on a single standard of silver, whereas others which were nominally using two metals were actually using a single metal, gold. The history of ancient and mediæval practice is a record of great confusion and disturbance. Although a double standard was usually the objective of government policy, nevertheless the principles determining the operation of such a standard were very poorly understood.

Gresham's Law.—Sir Thomas Gresham in 1560 advised Queen Elizabeth that debased and underweight coin tends to drive out full-weight coin. This advice has come to be designated in economic literature as Gresham's law, although it was not by any means original with Gresham. Similar advice was given by other observers of monetary troubles about two centuries earlier. In its simplest form the doctrine is, "Bad money drives out good." In more specific form the doctrine may be stated as follows: When metal is worth more as bullion than as money, it will disappear from circulation to be used either in the arts or for export to a foreign country. The principle was originally laid down to explain why degraded and debased coin was preferred to good coin. Well-intentioned rulers who provided their subjects with new full-weight coin were at a loss to understand why people preferred trash to *bona fide* coin.

It was only at a later period that Gresham's law was found to be applicable to the movement of the two metals under a bimetallic standard. In this new application the doctrine states that cheaper money tends to drive out dearer money. How is the relative cheapness or dearness of money ascertained? The question may be answered by assuming a specific case. Assume that a mint ratio of 16 to 1 is established, and that owing to a very heavy supply of silver on the market, the value of silver falls and the market ratio becomes 17 to 1. Obviously gold will buy more silver than it will when the market ratio is 16 to 1. Or, to state the matter the other way around, a given amount of silver will buy less gold. Silver has been cheapened. The mint ratio is said to overrate, or overvalue, silver. Anyone who possessed an ounce of gold could purchase 17 ounces of silver. But since 16 ounces of silver would coin into the same amount of legal tender money as one ounce of gold, by taking silver to the mint one would realize a profit of one ounce of silver on the transaction. It would, therefore, be to one's distinct advantage to utilize all the gold bullion that could be obtained for the purpose of purchasing silver to be coined.

Up to this point it is clear that silver, being the cheaper metal under the assumed case, would drive gold out of circulation. An additional tendency will appear for gold to be driven not only out of circulation but out of the country by export. Gold, being the more valuable metal, will be in demand for settlement of all foreign transactions. To refer again to the case assumed above, one ounce of gold will settle as much debt abroad as seventeen ounces of silver, but it will settle only as much debt at home as sixteen ounces of silver. Gold will have a greater purchasing power abroad than silver, but a smaller purchasing power at home. Unless, for some independent reasons, a favorable balance of trade is maintained, gold will tend to flow out of the country. Thus, as applied to bimetallism, Gresham's law means that the metal which is overvalued at the mint will tend to drive out of circulation and out of the country that metal which is undervalued. This general principle is necessary to an understanding of the later discussion of monetary standards.

Bimetallism in England.—Although England experienced many difficulties with the joint use of gold and silver from about the twelfth century on, nevertheless we may begin our discussion with the eighteenth century. In 1717 the mint ratio was fixed at 15.21 to 1, whereas the market ratio was in the neighborhood of 14.5 to 1. Under these conditions, gold was the cheaper metal and tended to drive silver out of circulation and out of the country. In the last quarter of the century the legal tender quality of silver was limited. Some debased silver coin remained in hand-to-hand circulation, but for the major transactions of the country, and especially for international settlements, gold was the actual standard. Thus England throughout most of the eighteenth century was actually on a single gold standard, although this condition was scarcely realized even by the most acute students of such matters at that time. Specie payments were suspended in 1797 and resumed in 1821. During the interim there was much discussion as to what the actual standard had been prior to 1797 and as to what it should be when specie payments were resumed. The most famous participant in these discussions was the economist, David Ricardo; and it is interesting to note that when Ricardo attempted to demonstrate that gold had for some time been the actual monetary standard in England, he aroused much opposition. It is also interesting to note that Ricardo preferred a single silver standard to a single gold standard. By the Act of 1816, which committed England to a return to specie payments, the following declaration was made:

> And whereas at various times heretofore the coins of this realm of gold and silver have been usually a legal tender for payments to any amount, and great inconvenience has arisen from both these precious metals' being concurrently the standard measure of value and equivalent of property, it is expedient that the gold coin made according to the indentures of the mint should henceforth be the sole standard measure of value and legal tender for payment without any limitation of coin, and that the silver coin should be a legal tender to a limited amount only.

This legislation sought to place England unequivocally upon the gold standard. It is significant to note that the gold standard originated in an accidental overvaluation of silver, during which gold, being the cheaper metal, drove silver out of circulation and out of the country. The transition from one standard to another was not direct, since a period of suspension of specie payments intervened. After a prolonged experience with fiat paper money, the country decided to resume specie payments. When the question arose as to what form of specie should be adopted, it was perhaps natural that, since gold had in fact been the standard for some time before specie payments were suspended, it should be adopted as the exclusive standard when specie payments were resumed. At the close of the Restriction Period, there was established by law what had already been established in fact when specie payments were suspended. This course of events is perhaps of special interest and significance because we shall later find that it is a very close prototype of the experience of the United States in reaching the gold standard.

The Theory of Bimetallism.—Bimetallism may be defined as a monetary standard in which there is free and unrestricted coinage of two metals at a fixed mint ratio, both metals being legal tender to unlimited amounts. According to the proponents of this plan, the market value of the two metals will deviate only slightly and temporarily from the established mint ratio. If one metal is plentiful and its value is reduced, then according to Gresham's law that metal will drive out the other. When this tendency is in operation the monetary demand, so it is claimed, will focus on the cheaper metal and will be diverted from the dearer metal. This shift of the monetary demand from one metal to the other will raise the value of the money which receives the new demand and lower the value of the metal which loses demand. This process will go on until the market ratio is restored to the mint ratio. This compensatory action will, it is claimed, be sufficiently effective so that neither metal will be completely driven out of circulation. Moreover, the plan will achieve the highest possible degree of stability of value in the monetary standard, since any marked change in the value of one metal will promptly be checked by the inertia of the other metal. The advocates of the system for the most part admit that for its successful operation an international agreement among leading nations upon a common mint ratio is necessary. If some nations have a single silver standard, some a single gold standard, and the rest double standards of varying mint ratios, then bimetallism has small chance of success. It is likely to degenerate into alternating single standards, under the operation of Gresham's law. The compensatory action of the two metals would not be strong enough to check the external drain of one metal unless international uniformity were established.

Although this has been the theory advanced by competent economists, nevertheless it has not been the theory prominent in the minds of most propagandists for bimetallism. The reasoning of many political leaders and social reformers has often been highly fallacious and even grotesque. Some have complained of a scarcity of money and have demanded that silver be freely coined in order to make money plentiful. This is a venerable fallacy which confuses money with income. Others have claimed that silver is naturally the money of the poor man and gold the money of the rich man and of Wall Street. Still others have claimed that the joint use of silver and gold is divinely ordained. Although such notions may seem ridiculous now, they at one time had a remarkakble vogue. Another group, the silver miners, were anxious to secure free coinage of silver because it would create a market for their product and sustain the price. This group clamored for a subsidy of the silver industry. Finally, a very numerous group protested against falling commodity prices and demanded free coinage of silver because they believed that the enhanced quantity of money would check the price decline.

Bimetallism in the United States.—Following the recommendations of Alexander Hamilton, Congress in 1792 enacted a bimetallic standard at a mint ratio of 15 to 1. This ratio was adopted because it was believed to correspond closely with the actual market ratio. However, silver soon became cheaper than gold and the market ratio shifted to about 15.5 to 1. Gold was driven out of circulation and out of the country. In 1834 the so-called Gold Bill changed the ratio to 16 to 1, with the deliberate intention of fixing a mint ratio higher than the market ratio, and thereby of bringing about a reintroduction of gold and an expulsion of silver. A tendency in this direction rapidly set in. In 1853 a bill was passed which applied to subsidiary coin certain limitations which were later extended to standard silver dollars as well. These limitations were in the form of lowering the bullion weight of subsidiary coin below face value, of restricting free coinage at the discretion of the Treasury, and of limiting the legal tender power of such coin. The direction in which this bill pointed is clearly apparent from remarks of the sponsor of the bill in the House: "Gentlemen talk about a double standard of gold and silver as a thing that exists, and that we propose to change. We have had but a single standard for the last three or four years. That has been, and now is, gold. We propose to let it remain so, and to adapt silver to it, and to regulate it by it."

In 1861 specie payments were suspended and both metals disappeared from circulation. A considerable amount of gold was exported. These tendencies were in accord with Gresham's law applied to a fiat standard where specie is at a premium in terms of paper. Paper (greenbacks), being the cheaper money, drove specie money out of circulation and, to some extent, out of the country. In 1873 the silver dollar was demonetized by the simple device of omitting it from the list of coins authorized. At the time, this discontinuance of silver coinage appears to have passed unnoticed because people were quite unaccustomed to the use of silver dollars. Silver dollars had been driven out of circulation because they had been overvalued at the mint. A generation had grown up habituated to thinking in terms of gold. Not until some years after the Act of 1873 did the new free-silver school term this law the crime of 1873. There appears to have been no attempt at secrecy in the enactment of that law, and yet no opposition was expressed at the time. In the decade following, the cheapening of silver, combined with demonetization of that metal in Europe and a general fall in commodity prices, gave rise to a political and economic bloc committed to a defense of silver. This bloc seized upon the Act of 1873 as one target for attack. There seems scant reason for the attack, because the law simply legitimized what appeared in fact to have been for the preceding generation the metal of ultimate money computation. In 1874 the legal tender of silver dollars was limited to a maximum of five dollars. In 1875 the Resumption Act was passed which permitted the country to resume specie payments in gold on January 1, 1879. It looked as if the country was legally as well as factually upon a gold standard.

Nevertheless, this state of affairs was not to go unchallenged. A rapid fall in the value of silver and the emergence of a free-silver school of economists, political leaders, and reformers led to certain important qualifying legislation. In 1878 there was passed the Bland-Allison Law, providing for purchase by the Government each month of from two to four million dollars' worth of silver bullion for coinage. When it was found that the coin itself did not readily circulate, provision was made for the issuance of silver certificates in small denominations. During the operation of the law from 1878 to 1890, approximately $253,000,000 were added to the currency. The silver dollars were made full legal tender, but the silver certificates lacked that quality. Although many have claimed that this new fund of currency constituted a great excess and tended to inflate prices, there seems to be no adequate support for that view. National bank notes were being rapidly retired during this period, owing largely to the reduction of the national debt; and to a large extent silver certificates took the place of the retired bank notes. Apparently the net increase in currency was just about sufficient to meet the normal growth requirements of the country. Whatever surplus was issued promptly became redundant and flowed back to the Treasury. The banks did not use silver as reserves for additional deposits, and there was no expansion of credit because of silver. The volume of bank credit did not depend upon the volume of silver. The relationship was the other way around. The volume of silver that could be kept in circulation depended upon the volume of credit outstanding. As a matter of convenience and custom, the public tends to keep a stock of hand-to-hand currency which bears a certain ratio to bank credit. Anything in excess of this ratio is redundant and disappears from circulation. Hence the silver certificates could not be inflationary as long as the banks did not use them as reserves for the inflation of their deposits.

In 1890 more drastic legislation in behalf of silver was passed in the form of the Sherman Act. The Secretary of the Treasury was directed to buy each month at the current market price 4,500,000 ounces of silver bullion, to be paid for by the issue of new Treasury notes of legal tender. Such notes were to be made redeemable in either gold or silver at the discretion of the Secretary of the Treasury. The Secretary of the Treasury was directed by a famous parity clause to maintain the two metals on a parity of value with each other. Tampering with the standard by injecting silver into circulation, and the fear of more tampering in the future, aroused a deep distrust of the stability of the unit of account both at home and abroad. As a result of this weakening of confidence, there occurred both an internal and external drain of gold. Internally, it took the form of hoarding of gold by the banks and the public; externally, the form of an unfavorable balance of payments and an expulsion of gold from the country. These developments were important causes of the panic of 1893. This panic, though it inflicted heavy losses upon the community, nevertheless had the beneficial effect of wiping the Sherman Act off the statute books. Immediately there set in a new campaign to establish free silver. This culminated in the political battle of 1896, in which the free-silver forces were led by William Jennings Bryan. The Republicans did not dare to oppose bimetallism as such, but took refuge behind a plank which committed them to negotiate for international bimetallism by agreement between countries. This Republican plank was looked upon more or less as a subterfuge, and the triumph of the Republican party was looked upon as triumph for the gold standard. In 1900 all doubt was put at rest by the passage of a law known as the Gold Standard Act. This was entitled: "An act to define and fix the standard of value, to maintain the parity of all forms of money issued or coined by the United States." The law enacted "that the dollar consisting of 25.8 grains of gold nine-tenths fine shall be the standard unit of value, and all forms of money issued or coined by the United States shall be maintained at a parity of value with this standard, and it shall be the duty of the Secretary of the Treasury to maintain such parity."

With these historical developments in mind, we may inquire: Just when did the gold standard begin in the United States? It is not without reason to date that standard from 1834, when the shifting of the mint ratio in fact gave us gold monometallism, although we were still nominally under bimetallism. The laws of 1853, 1873, and 1875, by placing further restrictions on silver, cemented the conditions brought about by the law of 1834. The laws of 1878 and 1890 meant the temporary adoption of what has often been called a *limping standard.* The word, "limping," refers to the fact that silver was made full legal tender but was restricted as to amount of coinage. The final Gold Standard Law of 1900 was a capstone to the process of transition which was in its incipient stages as early as 1834.[1]

Adoption of the Gold Standard by Other Countries.—After the discovery of gold in California in 1848, there developed in Europe a fear that the cheapening of gold would upset the bimetallic standard. Germany was aware of this danger and took advantage of the outcome of the Franco-Prussian War to adopt the gold standard in 1873. Helfferich describes the deliberate intention of the German government as follows:[2]

> It became ever clearer that, if Germany retained her silver standard, she would ultimately become isolated in currency matters.

Here was a case of refusing to drift into a crisis and of grasping opportunity by careful forethought. The French indemnity enabled Germany to accumulate quickly a substantial gold reserve. The law of 1873 dropped silver from free coinage and from unlimited legal tender. It frankly reduced silver to the status of a subsidiary coin with a bullion content less than face value. The new gold unit was spliced on to outstanding silver units by giving it a weight equal in value to silver coin at the ratio of 15.5 to 1.

France had bimetallism from 1803 to 1874 at a mint ratio of 15.5 to 1. During the forepart of this period, silver was the cheaper metal and drove gold in considerable measure out of circulation. After 1848 gold became the cheaper metal and began to drive silver out of circulation. By 1864 France had absorbed $680,000,000 of gold and had lost $345,000,000 of silver. The

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[1] Mention should be made of more recent silver legislation in the form of the Pittman Act of 1918. The purpose of this act was to conserve our gold reserves and to meet adverse trade balances with the Orient by the export of silver rather than of gold. The act called for the retirement of silver certificates and the melting of coin to an amount not in excess of $350,000,000. Federal Reserve Bank notes could be issued to take the place of silver certificates withdrawn. After the War the Government was required to repurchase silver and to reissue silver certificates, the Federal Reserve Bank notes being withdrawn simultaneously. The repurchases of silver were completed in June, 1923.

[2] *Money*, translated, 1927, p. 149.

Latin Union, formed in 1865 to cope with the international drain of metal under the double standard, and composed of France, Belgium, Switzerland, and Italy, entered into agreements in 1874 and 1878 which definitely suspended the free coinage of silver and in effect established a gold standard. The new gold units were simply a continuous form of the units outstanding prior to the adoption of the single gold standard.

Most other European countries rapidly came under the gold banner. Holland, Sweden, Norway, and Denmark suspended free coinage of silver between 1873 and 1876; India in 1893; Japan in 1897. By the last decade of the century there was not a mint in Europe open to the free coinage of silver. Most countries outside of Europe endeavored to tie their currencies up with gold directly, or indirectly through the gold exchange standard.

Russia and Austria represent a rather distinct approach to the gold standard. In the latter part of the century they undertook to resume specie payments, having been for some time employing fiat paper. When specie payments were originally suspended, these countries had actually been using silver; but when they returned to a specie basis, they decided to adopt a new unit in the form of gold.

It is significant that three separate types of approach to the gold standard are represented in the experience of the various countries. The United States and England abandoned specie payments at a time when bimetallism was the nominal standard but when gold was the *de facto* standard. They resumed specie payments after a prolonged experience with fiat currency, by adopting the gold unit which had prevailed before specie payments were suspended. The second type is represented by such countries as Germany and France, where a specie basis was uninterrupted and where a gold unit was spliced on to the existing bimetallic units. Silver was simply dropped from free coinage and from full legal tender and was thereby reduced to the status of a subsidiary coin. The third type is represented by Russia and Austria, where silver was the actual standard at the time of suspension of specie payments, but where gold was adopted as a new unit at the time of resumption of specie payments.

The world-wide scramble to embrace the gold standard reflects a fundamental preference for gold rather than silver. There had grown up in the minds of dominant classes a conviction that gold was more likely than silver to be a stable standard of value. There had become imbedded in the minds of business men and statesmen the impression that gold was the standard of the future, and that nations which delayed adoption of gold would isolate themselves from the central currents of world finance. Whether this conviction was sound or not is difficult to determine, but that it was a reality can hardly be doubted.

The Gold Standard Before the World War.—The pre-War gold standard did not possess exactly the same organization in all countries, but its fundamental principles were similar everywhere. The modifications from country to country were for the most part limited to details. Some of the main characteristics of the standard which were general and fundamental will be listed and discussed below.

(1) The standard unit of account and of value was defined by statute as a fixed weight of gold of a specified fineness. Thus the gold franc was 4.97806 grains of gold nine-tenths fine, the sovereign or pound sterling was 123.27447 grains of gold eleven-twelfths fine, and the dollar was 25.8 grains of gold nine-tenths fine.

By this device the number of units of purchasing power was made to depend upon the number of ounces of gold available as money. This meant that the supply of standard money was at the mercy of the gold mines. It was also at the mercy of the industrial arts, since increased consumption there drained gold away from monetary uses. The basic assumption underlying this arrangement was that complete nonintervention by political authority could be assured, and the gold supply left to purely automatic factors, of which the most important was the cost of production of that metal. This automatic regulation of supply would, it was believed, result in greater stability of value of money than could reasonably be expected under any other plan. The point to be emphasized is that the scheme of measuring the unit of gold by weight was a device for automatic nonpolitical regulation of supply for the purpose of obtaining sovereigns, francs, and dollars of steady purchasing power.

(2) This gold unit was given full legal tender. Silver was relegated to a secondary position, either by limiting its legal tender

to a maximum sum or by limiting its freedom of coinage, or both. Moreover, some part or all of the bank notes or other paper currency was usually made partial or full legal tender.

A legal tender is a form of payment which must be accepted by the creditor whether such creditor be the government or a private person.[1] In the great mass of transactions, what is or is not legal tender is not consciously a problem. Various forms of credit and currency are commonly accepted as a matter of custom in payment of debts. Obligations are settled by nonlegal tender freely and smoothly. But in case of dispute over a given obligation, debtors may wish to offer payment of the amount conceded by the debtor to be due. If such offer is refused, and the amount offered by the debtor is subsequently found by a court to be the entire amount owed by the debtor, the effect of such offer of legal tender money is to stop interest and court costs from the date of the offer.

The problem of legal tender becomes of greatest significance when the standard in which outstanding debts have been contracted is dropped and a new standard is adopted. If the new standard unit is of less value than the old, creditors suffer undeserved loss. Let us assume that a gold standard country overissues paper money and suspends specie payments. Prices are doubled and the value of money is halved. Under the new paper standard, paper notes are made final legal tender for all debts. Creditors then receive the same number of dollars when loans mature as they parted with when loans were originally made, but the dollars received in settlement have only half the purchasing power of the dollars originally loaned. Obviously, creditors are virtually robbed of one-half the true value of the principal sum.

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[1] Closely interwoven with legal tender is what may be termed government tender; that is, the form of money which the government uses in making disbursements. Usually government tender consists of one or more forms of payment which are legal tender in settlement of private and public debts, but there are occasions when the government finds it to advantage to concentrate disbursements upon one particular form of legal tender. For instance, between 1878 and 1893 the United States Government at times endeavored to make disbursements in the form of silver and to make collections in the form of gold. Again in the post-World War period the United States Government sought to impound gold by substituting gold certificates for Federal Reserve notes. In European countries the use of fiat paper was carried out in no small part by the device of having the government make disbursements in the form of new legal tender notes. The importance of government tender has been discussed by the German economist, G. F. Knapp, in his work on *The State Theory of Money* (1905 and 1924). See especially chapter II, section 6.

if the interest is paid at maturity, they are likewise robbed of one-half the value of the interest.

This kind of situation is illustrated by the legal tender notes which have frequently been issued as a means of war finance. For instance, the greenbacks of the Civil War period were legal tender notes, depreciated in terms of gold. The Supreme Court of the United States decided in the case of Bronson *vs.* Rodes (Dec. 1868)[1] that a contract which explicitly stipulated payment in gold must be paid in gold; but it also decided in The Legal Tender Cases (Dec. 1870)[2] that a contract which called merely for payment in money could be legally settled by a tender of depreciated greenbacks, even if the contract had been entered into before the passage of the greenback legal tender acts.

The latter decision has been severely criticised by economists, but it served as a precedent for many European countries during the World War period of depreciated legal tender money. In Germany the prevailing motto throughout the acute stages of inflation was, "A mark is a mark," and the policy of government was to require creditors to accept payment at face value in legal tender notes, even though the real value was only a millionth or a billionth of the value of the mark at the time the debt was contracted. Not until 1925 was definite legislation passed which frankly faced the injustice of legal tender administration of the inflationary period. This legislation provided for a revaluation or scaling down of important classes of debts contracted after 1918; for a reopening of certain kinds of claims under debts arising after June 15, 1922; and for some revaluation, although utterly inadequate, of the claims of holders of the public debt.[3]

Although the injustice of the treatment of creditors is grave, nevertheless it is in large part inevitable that such injustice should be inflicted upon some one when a shift from a specie standard to a violently depreciated paper standard is made. If creditors are protected, debtors will then bear the brunt of the loss. Injustice is inherent in the nature of the case, and if it does not fall upon one class it must fall upon another.

Another type of situation in which legal tender becomes a serious issue is national emergencies. Such emergencies create a feverish demand for legal means of paying debts, and threaten to drain the banks of legal tender cash. An earthquake or a declaration of war may create such alarm that a moratorium is required. The moratorium is an official declaration which suspends the payment of debts altogether until the emergency can be brought under proper control. National emergencies may further be illustrated by financial crises and panics. The public rush to the banks for cash and threaten to exhaust the reserves. At many times in the past, specie payments have had to be suspended during the most acute stages of the alarm. Even if this action is taken, the banks face the obligation to pay cash to their depositors on demand. Fortunately, however, the public do not, for the most part, discriminate between cash which is legal tender and cash which is not; and the clamor for cash in the United States can now be met by bank notes and Federal Reserve notes, even though these are not legal tender. Nevertheless, the banks are in a precarious position during such crises and devote every resource to the task of mobilizing legal tender and other cash to meet whatever strain may be placed upon them.

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[1] 7 Wallace, 229.

[2] 8 Wallace, 603; 12 Wallace, 529; 12 Wallace, 457.

[3] See HARGREAVES, E. L., "The Problem of Mark Debts," in *London Essays in Economics*, in honor of Edwin Cannan, 1927, pp. 157–183; also, HARGREAVES, *Restoring Currency Standards*, 1926.

Finally, the problem of legal tender often becomes important when a government attempts to fix the value of money by fiat of the sovereign power. It has often been falsely assumed that if a government compels everyone to accept legal tender paper money at its face value, it can thereby arbitrarily maintain the value of the money. This fallacy appeared frequently in post-War Europe. In the midst of acute inflation, many people insisted that money had not depreciated in value and could not, because its value was decreed by the state. But surely when the purchasing power of money has fallen to a fifth or a thousandth of its former amount, there is genuine and unmistakable depreciation of legal tender money. The matter need not be deceiving, for obviously all that the government can do is to force people to accept the money. The government does not thereby determine the *value* at which it shall be accepted. The value of the money will fall in proportion as the amount of note issue is carried to excess and confidence in its future value is undermined. The legal tender quality as such has very little to do with the purchasing power of the money. The quantity of issue and the confidence of the public are among the essential factors determining its value. When this principle is understood, there will be less tendency for governments to embark upon fiscal schemes requiring the issue of legal tender inconvertible notes in the expectation that the value of such notes can be fixed by government fiat, regardless of the quantity issued.

To summarize these matters, the legal tender of gold coin and bullion and of one or more elements of the currency has proved effective under ordinary and undisturbed conditions. During abnormal periods involving a suspension of gold payments and a resort to fiat paper, violent depreciation of the unit of value has been the rule, and grave injustice to creditor classes has been unavoidable. During sudden emergencies normal provisions for legal tender have often been held in abeyance pending the return of financial calm. Finally, attempts to fix the value of legal tender notes by fiat of the government, regardless of quantity of issue, have necessarily eventuated in violent depreciation of the money unit.

(3) Free, that is, unlimited coinage of gold, subject to whatever brassage or seigniorage charges might be imposed by the government, was maintained. This provision implies free and unrestricted circulation of gold coin among the public, or indirect circulation of gold by proxy in the form of gold certificates backed by 100 per cent specie in the treasury or central bank. Before the War, about 35 per cent of the world's stock of gold money was reported as being in circulation. One practical consequence of gold circulation is to keep the value of coin and bullion the same. As long as anyone can readily substitute one form of gold for the other, the value of bullion will tend to conform closely with the value of coin.

The term free coinage should be understood to mean the absence of any limitation as to the amount of coinage, rather than the absence of any charge for the expense of coinage. In the United States a *brassage* charge is imposed. If a person brings to the mint either pure gold or gold containing various degrees of impurities, the mint faces the task of reducing the metal to standard fineness. This involves an expense for melting, refining, and the addition of copper alloy. Depending upon changing costs, the brassage charge in the United States may be estimated at from 12 to 20 cents per 100 dollars. If a person brings to the mint gold of standard fineness, that is, nine-tenths fine, there is no charge whatsoever for converting the gold into coin. Under these conditions coinage of standard metal is *gratuitous.*

In some countries a charge in excess of brassage is imposed. This is a tax on the minting of coin and is usually called *seigniorage.* If the seigniorage charge is merely equal to the cost of minting standard gold, there is no profit to the government. However, it is possible to derive from a heavy seigniorage charge revenue for the government over and above the cost of coinage. At an earlier period it was common practice to impose heavy seigniorage charges, but under modern conditions the predominating practice is either to charge no seigniorage at all or to limit the amount to a point approximately equal to the actual cost of minting.

The reasons for this modern practice are chiefly twofold. First, if the face value of coin is greater than the bullion content as a result of seigniorage, there is a strong incentive to counterfeiting. Second, under seigniorage the value of the coin tends to exceed the value of bullion by the amount of the seigniorage, with the result that coin and bullion are not freely interchangeable in international transactions. There is a distinct advantage in keeping coin and bullion at the same value as a means of facilitating transactions in international specie markets.

France may be cited as an illustration of a country which has retained seigniorage. According to the pre-War arrangement, out of every 3100 francs coined, the government retained seven francs as seigniorage. The government coined the seigniorage and used it to pay expenses. Hence the quantity of money was about one-fifth of one per cent more as legal tender at home than as bullion in foreign exchange.

Although seigniorage as applied to standard money has been either abandoned or narrowly restricted in most countries, nevertheless it retains an important place in the management of subsidiary coin. Seigniorage in subsidiary coinage involves keeping the bullion value of the coin below the face value, so that no one will be tempted to melt down the coin. It also involves a limitation on the quantity of such coin so that its value may be held at parity with the standard, gold. Usually, seigniorage on subsidiary coin is accompanied by a limitation upon the legal tender powers of the nonstandard coin. In the United States, silver dollars are full legal tender, but all other coins of silver are legal tender only to the amount of ten dollars; and all coins of nickel or brass are legal tender only to the amount of twenty-five cents. Our so-called standard silver dollar is not a standard dollar at all, but is a subsidiary coin in the true sense of the word in spite of its full legal tender power.

(4) Gold reserves were used for the purpose of maintaining free and unhindered convertibility of all forms of paper and credit into gold at par. Either as a matter of legal requirement or of bank policy, gold was made readily available for redemption of all other forms of currency. Gold was thus commonly treated as the ultimate standard with which all other media of exchange were compared.

Two important corollaries of free convertibility may be noted. First, free and unrestricted circulation of gold coin was permitted. The proportion of the total stock of gold money which was in actual circulation depended mainly upon the denomination of the coin and the custom and convenience of the public. As a matter of history, the proportion in circulation had been slowly declining during the generation before the World War, and in 1913 was about 35 per cent of the monetary gold stock of the world. Second, the treasury or central bank stood ready to purchase at a fixed price unlimited quantities of gold from anyone presenting it and to sell gold with equal freedom. Purchase and sale of gold accomplishes the same purpose as actual coinage, but does so without the cost of reducing the metal beyond the stage of bullion and without placing upon the private individual the inconvenience of carrying coins away from the mint. The official transactions in gold were supplemented by the transactions of the leading money markets of the world. The principal pre-War market was London. There gold could be bought or sold at any time and to any amount. The market price of gold bullion was quoted currently, and although it moved slightly above or below mint-price, depending upon conditions of supply and demand, nevertheless the deviations from mint price were very small.

(5) There was free movement of gold from money into the industrial arts and from such arts into money. Manufacturers of gold plate or gold jewelry could purchase gold bullion or redeem currency in gold coin and melt down the coin. If they had a surplus of the metal, they could always turn it in at the mint at approximately the standard price. Consequently, the

value of gold as bullion, as coin, or as raw material in the arts tended to be substantially uniform. The only differences arose from costs of conversion from one form to another or from costs of transportation, and these differences were relatively slight.

(6) Free international movement of gold was maintained. Exports and imports of specie were possible at the will of bankers or individuals. There resulted a fluid international market, with a tendency toward equality in the value of gold in all countries. The only element of deliberate regulation of gold shipments between countries was the central bank policy with respect to discount rates and open-market transactions. Within certain limits, central bank control could conserve a country's gold reserves when a severe external drain was imminent. By advancing the rate of discount and disposing of assets in the open market, money rates could be tightened and thereby the earning power of gold at home could be raised to a point sufficient to avert its excessive exportation. Because of the intervention of central banks in this manner, the international flow of gold cannot be said to have been purely automatic. Nevertheless, the form of control exercised was ordinarily a minor factor in gold movements. Such movements were to a remarkable degree free from arbitrary regulation.

(7) International exchange rates afforded a sensitive mechanism for the international adjustment of balances of payments, price levels, and gold shipments. A so-called mint parity existed between all gold standard countries. This parity was simply the ratio between the weights of gold in the money units of the respective countries. When actual exchange rates deviated from this mint parity by a margin greater than the cost of shipping gold, specie tended to move from one country to another. To illustrate, the mint parity between the United States and England is commonly expressed by quoting the pound sterling as equal to $4.8665. This quotation means that the pure gold in the pound weighs 4.8665 times as much as the pure gold in the dollar. The cost of shipping a pound sterling from New York to London is between two and three cents, depending upon variations in express charges, insurance rates, interest loss, and abrasion. If the actual rate rises to about $4.88, it is said to have reached the gold export point, and gold will tend to flow out of the United States. If the actual rate falls to about $4.84, it is said to have reached the gold import point, and gold will tend to flow into the United States.

These points at which gold will tend to be exported or imported are called the specie points. When specie is shipped between countries, the pressure for means of payment is relieved and the actual rates of exchange brought within the specie points. The processes of this adjustment are too complex to be fully described at this point. They are the subject matter for theories of international trade, balances of payments, and foreign exchange. However, it is to be emphasized here that the mechanism of international adjustment is an integral part of the gold standard. The adjustment takes the form of the automatic stabilization of exchange rates at mint par, allowing only a deviation from par equal to the specie points, by permitting free gold shipments in international markets. This international aspect of the gold standard is fully as essential as the domestic aspect in the effective operation of that standard.

The Post-War Gold Exchange Standard.—The gold standard has undergone important modifications in most countries as a result of the financial disturbances of the World War. The modifications have been less in the United States than elsewhere, but even in this country significant changes have occurred. The modifications appear to have arisen in part from the uprooting of old customs in the use of gold, and in part from the need for economy in its use. The modified form of the gold standard is commonly designated the gold exchange standard. This institution, born of war vicissitudes, is far from a stereotyped, uniform system. It shows widely varying characteristics from country to country. Nevertheless, in the midst of this variety, there are fundamental principles of monetary organization which permeate all separate versions of the gold exchange standard. To these fundamental principles we may direct attention and analysis.

(1) The monetary unit is still defined as a fixed weight of gold, but this unit may be derived by arbitrarily linking the domestic unit with the gold unit of some foreign country or countries where the gold standard is more firmly established. Before the War, India maintained the rupee at a parity with 1*s.* 4*d.* of English money, or a ratio of 15 rupees to 1 pound sterling. In 1927, India adopted a domestic rupee equal to 1*s.* 6*d.* Austria has returned to gold on a new unit, the schilling, equivalent to $0.1407. These are illustrations of the possibility of defining the local unit in terms of a fixed ratio to foreign units.

The new local unit may not be coined, may not be allowed in circulation, may not even be used to redeem other currency, may not move freely in and out of the country, and yet may effectively serve the functions of a domestic and international standard of value and unit of account, and link the price levels and exchange rates of the home country with the gold-using world outside. The mechanism by which this result is attained is explained in succeeding paragraphs.

(2) Gold is full legal tender, but if gold coins are not in circulation, the legal tender qualities of the metal have limited application. Some part of the actual medium of exchange is made legal tender as a supplement to gold. Usually this quality is attached to the main form of bank note in actual circulation. Although such notes may not be convertible into gold coin or even into gold bullion, nevertheless they are maintained at a parity of value with the gold unit of account. It is no hardship to creditors to be required to accept paper legal tender in lieu of gold, so long as this parity of value is jealously guarded and preserved.

(3) Free coinage of gold is usually prohibited under the gold exchange standard. Gold performs its functions as a standard of value and unit of account in bullion form. The government or central bank may arrange to purchase gold bullion at a fixed price or to sell it at a fixed price, or both; but diversity of practice in these respects is rather wide. If the country is in a sufficiently strong financial position, it usually prefers to purchase and sell bullion in any quantities desired at the standard price. In some of its basic effects, this arrangement is the equivalent of free coinage. It enables new gold produced or imported to find a market and to pass freely into central bank reserves and it likewise enables dealers in the industrial arts or in gold exports to obtain as much metal as may be desired. Thus, the essentials of a free gold market may be maintained both locally and internationally without the provision for free coinage of the metal.

(4) Convertibility of currency into gold coin is abandoned. In its place, two possible devices for accomplishing the same end are available. First, it is possible to redeem currency in gold bullion. For instance, the Bank of England returned to gold in 1925 under a regulation requiring the Bank of England to furnish gold bars of approximately 400 oz. troy, fine gold, on demand. This regu-

lation limits convertibility to holders of currency in sums equal to or above the minimum requirement. It is a variation of the gold exchange standard which is often called the *gold bullion standard.*[1]

The second possible form of convertibility is illustrated by the plan of Germany where the Bank was permitted to redeem at its discretion in gold bullion or gold exchange. The latter option takes the form of offering the note-holder drafts drawn against gold deposited in foreign banks. If he wishes, he may have the gold imported. This roundabout process of redemption is not as clumsy as may at first appear. It eliminates the nuisance of redemption by small holders of currency and yet, by enabling the banks and large-scale holders of currency at any time to exchange currency for claims to foreign gold, it successfully maintains the value of all domestic currency at parity with gold. Consequently, it performs the essential function of making the value of currency conform with the value of the gold unit and yet it makes possible a great economy in the use of gold by eliminating specie from actual coinage or circulation.

(5) The form and location of the reserve involve special arrangements with outside countries. Part or all of the gold reserve may be kept abroad. It may be deposited with banks in leading money markets and held available on demand of the home country. The term, "earmarked gold," refers to the practice of isolating gold held to the account of another country. To a considerable degree the practice of keeping gold reserves in foreign financial centers economizes the use of gold. If such gold is not set aside as an idle fund for the specific use of this specific country, it acts simply as a part of the general gold reserve of the banks of the financial center. Consequently its function as a reserve is duplicated, since the same gold may serve as reserve for bank credit in more than one country.

The extent of this economy depends largely upon the form in which the reserve is kept. There has been since the War a striking growth among central banks of the practice of holding much of their reserve in the form of foreign bills of exchange, bank balances and short-term investments in foreign markets including acceptances, treasury bills, and loans on stock exchange collateral. It has been estimated by the Federal Reserve Board that at the end of March, 1927, leading central banks of the world held liquid foreign assets to the amount of some one billion six hundred million dollars, of which approximately one billion were held in the United States. Although this plan enables central banks to convert idle gold reserves into earning assets, nevertheless the ultimate economy in the use of gold is easily exaggerated. Since central banks of various countries place their holdings of liquid investments with each other, the amounts in considerable measure cancel out. If country A places one hundred million dollars of liquid assets with country B, and country B places the same amount in country A, each country has an important foreign credit but there is no net economy in use of gold in the aggregate.

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[1] It is interesting to note that this plan was advocated by Ricardo more than a century ago as "An expedient to bring the English currency as near as possible to perfection." See his pamphlet of 1816 on *Proposals for an Economical and Secure Currency*, reprinted in *Ricardo's Economic Essays*, edited by E. C. Gonner, 1923.

(6) During the initial stages of the gold exchange standard, it is rather common to impose some restrictions upon the export and import of gold, but after the standard has been securely established, full and unrestricted exports and imports of the metal may be permitted. The intervention of central banks may be confined to manipulation of the discount rate and direct purchase and sale of bullion. The degree of central bank control is probably considerably greater than it was in the pre-War era, but the free movement of gold still remains a fundamental factor in international financial adjustments.

(7) The stabilization of exchange rates at a predetermined ratio with the gold unit of some foreign country or countries is maintained. This arbitrary control of rates places important financial powers in the hands of the central bank or the government, or both. These powers have to do with the balancing of the state budget, the establishment of a normal balance between exports and imports, the regulation of the discount rate of the central bank, the regulation of the volume of domestic currency and of the internal level of prices, the arrangement of foreign loans where necessary, and the buying and selling of foreign exchange in order to stabilize its price within the specie points.

Brief consideration may be given to the interrelations between these powers.

A. The budget must be balanced. If fiscal deficits are allowed to accumulate, they require fresh issues of fiat money. These issues lead to new inflation of domestic prices and throw the internal value of money out of line with world gold values. Balancing the budget may require the introduction of new rigid economies in government expenditure and the imposition of new and heavier rates of taxation. When a country newly adopts the gold exchange standard, it may not be able immediately to make revenues equal to expenditures. In such an event, the government must secure loans from foreign countries or from internal bond issues to aid in meeting expenses until budgetary equilibrium can be attained. England, Poland, Germany, Austria, Hungary, Belgium, and other countries have resorted to foreign loans for such a purpose. Austria and Hungary both submitted to the rather arbitrary supervision of an outside commissioner-general while their budgets were being brought into balance.

B. Exports and imports must be brought into a normal balance. A continued excess of imports of merchandise would drain the country of gold and rapidly use up loans and foreign credits in support of the exchange rate. Exports may be maintained by encouragement of home industry and home production. Abnormal restraints on trade may be removed. Internal prices may be kept in line with international prices, to the end that foreigners may find the country a good place in which to buy. In short, a so-called unfavorable balance of trade cannot be allowed to develop to excess. If it did, the value of the country's money in foreign exchange markets would fall, rates of exchange on the country would fall, gold would be drained out of the country, and all credits which the country had abroad would be used to support exchange rates in an attempt to offset the excess of imports and the consequent excessive demand for exchange at home and supply of exchange abroad.

C. The discount rate of the central bank must be regulated with a view to aiding in stabilization. Such a rate influences numerous factors. A high rate tends to prevent an export of gold from the home country, because gold is worth more where interest rates are relatively high. Thus the discount rate may be used as a means of conserving the domestic store of gold reserves. Furthermore, a high rate tends to restrict the volume of loans and deposits and so to prevent inflation of the internal price level. As a consequence, the value of the country's currency is prevented from depreciating below parity with gold. On the other hand, a high discount rate depresses domestic business because the cost of borrowed capital becomes burdensome, and is likely to cause some unemployment. The country must steer a middle course between these considerations and arrive at a rate of discount which conserves gold, prevents inflation, and yet accommodates business and relieves trade depression.

D. The volume of domestic currency must be so controlled as to keep the internal price level in line with the price levels of gold standard countries. Overissue of notes and deposits will cause inflation of prices and a fall in the value of money as well as in foreign exchange rates. What is the corrective? The country must stand ready to buy exchange abroad or sell it at home at the fixed parity. At the same time, it will retire a proper amount of domestic currency from circulation, thus lowering prices and supporting the value of the currency in the money markets. As soon as internal prices are brought back into line with world prices, exchange rates will tend automatically to remain within the specie points and the government or central bank can withdraw from its dealings in the foreign exchange markets.

E. Foreign loans must be arranged in time of emergency and must be supplemented by internal loans. Such loans may be used temporarily to meet budgetary deficits or an unfavorable balance of trade. They may also be used for the purpose of setting up foreign credits to be used to support the exchanges. As an aid to financial reconstruction, and to return to the gold standard in some form after the War, such loans were very widely employed.

F. The central bank must actively buy and sell foreign exchange whenever the market rates threaten to get outside the specie points. By coming into the market on the supply or demand side as conditions require, the central bank may insure stabilization of exchange within the specie points. From 1923 to 1925, Austria by such policy maintained the kronen at .0014 cents, and after 1925 maintained the new monetary unit, the schilling, at 14.07 cents. Austria had one of the most stable exchange rates in Europe during this period of unsettled financial conditions.

Outlook for Economies Under the Gold Exchange Standard.—The gold exchange standard has frequently been referred to as a source of revolutionary economies in the use of gold. There are many who assume that these economies will continue at such a rapid rate in the future that they will be a guarantee against a shortage of gold in the monetary structure of the world. This view is discussed more at length in a later chapter (see Chapter XIII), but the essence of the matter may be briefly stated at this point. The gold exchange standard may economize gold in two ways: first by withdrawing gold from circulation, second by pooling gold reserves internationally. The former method has been firmly established in custom and usage, and there is little likelihood that the world will return to the wasteful practice of using gold coin for hand-to-hand circulation. However, this economy has now been completed. There is no more gold to withdraw from circulation; hence there is no possibility of further economizing in this direction.

The international pooling of reserves is usually exaggerated because, as already pointed out, the mutual exchange of reserves cancels and leaves a relatively small net gain. Moreover, the practice requires a frank surrender of nationalism. It amounts to a form of gold disarmament among the nations of the world. Some idealists have proposed an international compact under which all countries would agree to concentrate their reserves in London and New York. It would appear that such a compact has scarcely a better chance of completion than did international bimetallism a generation ago. This is not to deny that international coöperation in the marketing of liquid foreign assets is likely to make some future progress, but it is to suggest that expectations of far-reaching and revolutionary changes are seriously overdrawn.

The Managed Standard.—During the decade beginning with the World War, numerous countries demonstrated the possibility of maintaining paper money as the standard unit of account and the medium of exchange. This phenomenon of a paper standard has frequently appeared in various countries during the last two centuries, both in time of war and of peace. Unfortunately such paper units have usually been grossly overissued, and have led to wide fluctuations of prices. Paper money has usually been associated with sharp depreciation of the value of the unit and bitter financial consequences. Nevertheless, out of these experiences there has arisen the doctrine that under proper conditions, the paper standard can be so controlled and managed as to eliminate a repetition of the evils of the past.

The paper standard stands in sharp contrast to the gold standard, or to other forms of the commodity standard. Conservative authorities have insisted that a standard money must consist of an object which has utility and exchange-value as a commodity. Gold or silver fulfills this requirement, since either metal is in demand in the industrial arts. The proponents of the paper standard oppose this commodity view on the ground that a paper unit properly managed can perform effectively all the functions of a true money. Experience shows that a paper unit can enjoy general acceptability among the public. The fact that it originally acquired this acceptability because it was a promise to pay gold may be of historical interest; but the practical fact of modern interest is that in the course of financial evolution specie payments have from time to time been suspended, and that inconvertible paper money has at such times won universal acceptability on its own account. As the ultimate money of redemption paper itself is capable of having universal acceptability in the community.

Upon what does this acceptability rest? The force of custom is important, since people who acquired the habit of using paper notes when they were convertible go on using the same notes unquestioningly after convertibility has lapsed. There is a momentum of usage which carries over into the era of inconvertible paper. But this confidence in the paper unit also has a rational basis. People believe that the paper notes will in fact give them ready command over goods and services. They know as a matter of experience that the paper tickets or counters will buy the things they desire. From a purely pragmatic standpoint the money works. Moreover, people have a rational confidence in the legal tender quality of the paper notes. They know that the paper certificates will settle debts. Also they may calculate that the paper money will afford a suitable store of value. By means of paper titles they can keep a certain proportion of their resources in the form of a ready command over goods. Finally, people may form expectations of the constancy of value of the paper unit. At this point past experience is discouraging, since almost invariably paper standards have been notoriously unstable in value. The crucial test of a paper standard is whether it can give reasonable assurance of having stability of value and so of constituting a true standard of value and of deferred payments.

This crucial test involves the whole question of the determination of the supply of money. A paper standard differs from a commodity standard chiefly in the way in which quantity of issue is governed. In the commodity standard, there is a high degree of automatic control of supply. For instance, the gold supply is directly limited by the discovery and exhaustion of gold mines and the costs of producing the metal. Danger of overissue of gold is at a minimum, since supply is at the mercy of the slow process of mining the metal. The case is quite different with paper. The printing press can double the quantity of notes over night, whereas under the most rapid production of gold the supply of that metal would not double itself in less than twenty or thirty years. The advocates of the paper standard contend that it is entirely feasible to limit the quantity of paper money deliberately and by so doing to stabilize its value. To state the issue in terms of a sharp contrast, it is a matter of the automatic limitation of the supply of gold by natural processes of mining versus arbitrary limitation of the supply of paper units by artificial control.

If the doctrine of the managed standard is at first glance disturbing, let the reader ponder the obvious fact that the gold standard has already moved so far away from the principle of purely automatic control of supply that it has become a semi-managed standard. The more the gold standard evolves toward a gold exchange standard, the greater the element of deliberate control and regulation. The withdrawal of gold from circulation and the placing of reserves on deposit at foreign banks have been basic changes involving a high degree of intentional control of the standard. Introduction of the Federal Reserve Act in the United States modified reserve ratios, created facilities for concentration and mobilization of reserves, and established agencies which operate in the open money market and which fix rediscount rates charged to member banks. By a variety of devices deliberate management of gold has displaced automatic control and regulation. This growth of conscious control has doubtless been an incidental outgrowth of the general evolution of credit and currency as the dominant portions of the nation's total means of payment. The major swings of prosperity and depression are financed by expansion and contraction of credit, rather than of gold. Cash and bank reserves place an ultimate limit upon the length to which expansion can go, but short of that limit the range of movement of credit is wide. When credit swells, people require more hand-to-hand cash; when credit shrinks, cash is redundant and flows back to the banks. Hence, to a high degree, notes and specie are dependent upon what happens to credit. This is highly significant because credit is susceptible of deliberate control. Unlike gold, its volume is not governed by mineral resources and cost of production but by banking policies and banking controls. Consequently the growth and relative importance of credit has transformed the gold standard from a primarily automatic system to a semi-managed system. A managed standard is not, therefore, a fantastic dream, but, to some extent, a condition which already exists.

One of the greatest difficulties in managing a pure paper standard would arise in the field of international transactions. Nonmetallic units could not readily be translated internationally into common terms, and exchange rates would be subject to sharp fluctuations. Hence, even if paper units were adopted for the internal standard, it would probably be necessary to retain gold for external, or international, transactions. Fuller discussion of this aspect of the problem is reserved for later chapters. (See Chapter XXI.)

The purpose of this section is neither to espouse nor to condemn the proposal of fiat money, but to state the problem and to suggest some alleged advantages and some difficulties. As the gold standard itself succumbs more completely to deliberate management, it is quite possible that gold itself may evolve into a fully controlled and managed standard. It is probable that whatever merit there may be in the principle of management of the standard can be secured more smoothly and safely by grafting that principle on existing metallic standards than by starting some wholly new scheme of fiat paper standards.

But whatever may be the ultimate best course, at least it is clear that the gold standard is not a fixed and final product. Rather it is a dynamic institution in the process of development. Much of its original structure has already been scrapped, and perhaps more will be. Faith in its magic power to stabilize the value of money has been shattered. The course of its evolution tends to make the standard less and less automatic and more and more in the nature of a fiat or managed standard. The weakness of *laissez faire* in questions of the standard has been abundantly demonstrated. The question is not whether the money standard can or should be managed, but how bankers and governments can make certain that the policies of management are wise and sound.

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Chapter IV

PRICE MOVEMENTS AND THEIR CONSEQUENCES

The Construction of Index Numbers.—The present section will not endeavor to give a technical analysis of index numbers, but will presuppose some elementary knowledge of the statistical devices employed in making index numbers.[1] The treatment will be confined to the economic use and interpretation of index numbers constructed by various methods.

Price indexes are measuring devices. They are employed for the purpose of measuring the central tendency among diverse changes of many individual prices. They are a form of statistical average which makes possible price comparisons between different periods of time.

If we compare the movement of prices between two different dates, we discover that some prices are rising, some falling, some constant. Running through these diverse movements of individual commodities there will be a general trend which is subject to statistical measurement. The possibility of measurement arises from the fact that small fluctuations are more frequent than large fluctuations. The majority of individual price relatives will cluster near a central tendency. When the central tendency is rising, a larger proportion of all prices is likely to be in the rising group; and when the central tendency is falling, a larger proportion of all price relatives is likely to be in the falling group. But whether the central tendency be up or down, the concentration of individual prices above and below the tendency gives rise to a situation which lends itself to statistical measurement.

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[1] The following general references may be suggested: Mitchell, Wesley C., *Bulletin No. 284*, United States Bureau of Labor Statistics, 1921; Fisher, Irving, *The Making of Index Numbers*, 1922. In addition to these general treatments of the subject the following brief chapters or articles may be mentioned: Day, E. E., *Statistical Analysis*, 1915, chs. XXI–XXIII; Young, A. A., *Handbook of Mathematical Statistics*, edited by H. L. Rietz, 1924, ch. II; Kelly, T. L., *Statistical Method*, 1923, ch. XIII; Flux, A. W., "Measurement of Price Changes," *Journal of Royal Statistical Society*, vol. LXXXIV, 1921, pp. 167–215; Bowley, A. L., *Elements of Statistics*, 1920, ch. IX; Riegel, Robert, *Elements of Business Statistics*, 1921, chs. XVIII and XIX; Chaddock, R. E., *Principles of Mathematical Statistics*, 1925, ch. X; Crum, W. L., and Patton, A. C., *Introduction to the Mathematics of Economic Statistics*, 1925, chs. XVIII–XIX; Jerome, Harry, *Statistical Method*, 1924, chs. XI–XII; Coats, R. H., *Wholesale Prices in Canada*, 1910; Edgeworth, F. Y., *Papers Relating to Political Economy*, 1925, vol. I, pp. 195–405.

It is to be noted that the group of prices which are rising at any one period may rise by an indefinitely high percentage. For instance, during the World War certain commodities rose between four thousand and five thousand per cent. However, the group of prices which are falling cannot have a percentage of fall in excess of 100 per cent. If a price were to fall 100 per cent, it would be zero, and the commodity would be a free good. Subject to these limitations, individual prices may show many different patterns of scatter, dispersion, variability, or displacement. The possibility of such nonuniformities may be suggested by the following indexes of a small number of commodities:

TABLE I

COMMODITY PRICE INDEX IN JANUARY, 1927

(1913 = 100)

Petroleum, crude	200
Lumber	198
Coal, bituminous	187
Wool	184
Flour, wheat	183
Cement	162
Wheat	157
Steel	146
Silk	146
Pig iron	133
Hides	84
Copper	85
Rubber	48

The interrelations of individual prices are important subjects of study and analysis, but the present discussion is limited to the central tendency running through these interrelations.

(1) *Base Period.*—The deciding factor in selecting the base period to represent 100 is the purpose for which the index number is to be used. During the period following the World War, one of the most common purposes was to compare post-War with pre-War prices. Consequently a very large number of price indexes adopted either 1913 or the five-year period 1910-1914 as a fixed base. Where the purpose is to make a year-to-year comparison of prices, a chain base system is often employed. Each year is taken as a base of 100 for the year following. The indexes can be computed in their original form on the chain principle,

or they may be derived from an index having a fixed base by the process of dividing the index number of the year following by the index number for any given year. This process will not be strictly accurate, but will be sufficiently so for most purposes. There are some price indexes, of which Dun's and Bradstreet's may be cited as illustrations, which have no basing point. Such indexes state the number of dollars spent on a given budget of commodities each year. Hence they are expressed in dollars rather than in percentages. They may, however, be readily converted to percentages by the process of dividing the number of dollars spent in any other year by the number of dollars spent in any year adopted as base.

The adoption of the base period affects the accuracy of the index number. The more remote the base, the greater the liability to error in the index number. The Statist index (a continuation of Sauerbeck's index), expressed with reference to the period 1867-1877 as a base, is open to the objection that the base is remote. The index of the United States Bureau of Labor Statistics was originally expressed with reference to the period 1890-1899 as a base, later shifted to 1913 as a base, and still later shifted to 1926 as a base. The user of index numbers should always take into account the nearness or remoteness of the base period, and the possible bias which this factor may introduce into the index number.

Where it is desired to compute price percentages over long periods of time, the use of the remote base is, of course, inevitable. The chart on page 214 suggests the price trend which appears over a century and a quarter with reference to 1913 as base. Such a long range comparison is made possible by splicing together successive indexes originally computed on independent base years. The results are approximately accurate, and are significant if the limitations under which they are constructed are understood.

(2) *The Number of Commodities.*—Price indexes utilizing only ten to twelve individual commodities have been found sufficiently inclusive to offer highly sensitive barometers of business conditions. They are useful as measures of the business cycle. However, most of the general purpose indexes of wholesale prices utilize a much larger number of commodities. The index of the War Industries Board for 1913-1918 was constructed from 1366 individual commodities. The wholesale index of the United

States Bureau of Labor Statistics originally included about 250 commodities, but by successive increments has grown to include about 550. The Irving Fisher index includes about 200, Dun's about 300, Bradstreet's, 96. Most index numbers in use in European countries include from forty to fifty commodities.

Special purpose indexes often include a relatively small number of commodities. An index of prices of farm crops computed by the United States Department of Agriculture includes thirty items. An index of basic materials computed by the Federal Reserve Bank of New York contains twenty items. An index of foods computed by the *Annalist* contains twenty-five items.

Where the objective is to obtain a complete measure of the purchasing power of money, it is possible to combine a number of indexes, each one of which contains a large number of individual items. For instance, Carl Snyder has computed a general index based upon ten component group indexes, including wholesale prices, cost of living, security prices, real estate prices, etc.[1] The resulting index is the most comprehensive measure of the general purchasing power of money that has been obtained.

The number of commodities employed in index numbers is related to the problem of accuracy. If the assortment of commodities is truly representative, and if the quotations are precise, a relatively small number of commodities will yield a highly accurate index number. However, if data are of limited accuracy, the introduction of a large number of commodities may tend to cancel errors of individual quotations. The matter is stated as follows by Irving Fisher:[2]

> An index number really valuable has been computed for as few as ten commodities,—that recently constructed by Professor Persons to be used for forecasting. Seldom, however, are index numbers of much value unless they consist of twenty commodities; and fifty is a much better number. After fifty, the improvement obtained from increasing the number of commodities is gradual and it is doubtful if the gain from increasing the number beyond two hundred is ordinarily worth the extra trouble and expense.

(3) *Selection of the Commodities.*—Out of the hundreds of thousands of commodities which are commonly traded in, it is necessary to select certain representative samples to be included

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[1] For complete list of commodities and weights, see page 385.

[2] Fisher, Irving, *The Making of Index Numbers*, 1922, p. 340.

in the index number. The problem of determining a proper distribution of samples so that all classes and types of commodities will be suitably represented is difficult. Nevertheless, the problem is capable of solution. The greater the accuracy in selection of sample commodities, the smaller the number of individual commodities needed.

One criterion in the selection of commodities is uniformity in the commodity over a period of time. It is possible, for instance, to include such a commodity as women's dress goods, whereas it would be impractical to include women's dresses. The former product is fairly well standardized, whereas the latter is subject to all the variations of fashion and style. Not until 1926 was the Bureau of Labor Statistics able to arrive at a standard definition of automobiles, owing to the frequent changes in sizes and models of the product. Many commodities undergo improvement or deterioration in quality, with the result that although the unit nominally is constant the content of the unit is variable. These difficulties are least serious with basic materials, and most serious with finished manufactures. Most wholesale index numbers employ a relatively limited number of finished manufactures and rely heavily upon raw materials and semi-manufactured products. This proportioning of different types of commodities is significant, because the prices of finished goods contain a very large element of labor cost. During a period when wages have been rising or falling rapidly, the goods nearest the consumer reflect labor cost, and if these goods are slighted in the selection of commodities the index number will be misleading.

The selection problem involves a recognition of different classes of commodities and prices. A general wholesale index should contain a fair distribution between raw materials, which show wide oscillations; consumers' goods, which show relatively narrow oscillations; farm crops, which reflect weather and climate; minerals, which show sensitivity to the business cycle; internationally traded articles, which reflect world-wide market conditions. Care must be taken to limit duplication of commodities at successive stages of manufacture. An index which includes, for instance, iron ore, pig iron, steel billets, steel rails, and automobiles, involves considerable duplication, since the same commodity is counted several times at successive stages of manufacture.

To summarize, a fair distribution of groups of commodities and representative samples in each group are primary criteria in the selection of commodities.

(4) *Collection of Data.*—Two kinds of data are required, prices and weights. Weights may involve either physical quantities or money values of commodities. For the most part, price data are more readily available in up-to-date form than quantity data. Data on values or quantities have to be obtained from census records, government reports, and trade association reports, and are not usually available month by month.

Most American price index numbers employ either market quotations or contract prices. Market quotations are usually in the form of bid or asked prices and are obtained from trade journals, newspapers, produce exchanges, and so forth. Their strict accuracy is often questionable, partly because the bid or asked price may not be the actual price at which sales are made, and partly because such quotations change hourly. Moreover, their amount will depend upon the time period which they cover. Some quotations are taken daily as a basis for computing the monthly average, whereas others are taken on a specific date, as on the first or the fifteenth of the month. Contract prices are based upon actual sales by representative manufacturers and dealers. For example, the Bureau of Labor Statistics collects prices on Portland Cement from about ten different plants in scattered sections of the country and takes the average as the final price for the month.

The field work of assembling price and quantity data requires the utmost skill and judgment on the part of the investigator. If the work is well done at this stage and the data are reasonably accurate, the main part of the battle is won. The number of commodities may be relatively small without impairing the accuracy of the index number, provided the original data are correct.

(5) *The Mathematical Formula.*—To the popular mind, the word average usually connotes merely an arithmetical mean. This notion is, of course, utterly inadequate. An average may be any one of many different things. Irving Fisher, in his book on *The Making of Index Numbers,* has discussed 96 main formulæ for computing averages, and 38 supplementary formulæ—134 in all. The formulæ in most frequent use are variations of the principle of the arithmetical mean, the median, the geometric, or the aggregative. Two other types of averages, the mode and the harmonic, are not much used.

Fisher, in the book referred to above, arrives at the opinion that fully thirty out of the one hundred thirty-four formulæ examined give results which are accurate within a fraction of one per cent. As an instrument of measurement, the index number is therefore fully as accurate as other devices of physical measurement, such as the pound or the yard.

Averages may be distinguished by the process of weighting. They are commonly divided into simple formulæ and weighted formulæ. The former are often thought of as unweighted, because no attention is given to the problem of weighting. However, what really results is weighting by a haphazard and unconscious process. There can be no such thing as an unweighted index number. The contrast is between index numbers which are weighted by a deliberately conceived plan and those which are inadvertently and illogically weighted.

Nevertheless, it is sometimes necessary to resort to haphazard weighting where data on quantities or values are not available. Bradstreet's index is of the simple aggregative type in the form of the sum of a series of prices reduced to a per pound basis. The haphazard weighting actually results in giving about forty per cent of the emphasis to three groups of commodities: cotton fabrics, hides and leather, chemicals and drugs. More by accident than by design, these commodities turn out to be highly sensitive to the business cycle, and Bradstreet's index is commonly recognized as a very good series to reflect cyclical fluctuations. However, in general, the simple aggregative has a very high probable error and is to be avoided as much as possible. A simple arithmetic average is open to the same dangers, but under certain conditions it may be resorted to with the understanding that the results may have an error of from five to ten per cent. Where simple averages must be employed, it is usually preferable to use the geometric mean or the median. Although any of the simple averages are open to criticism, nevertheless under favorable conditions they will give fairly good results. If the commodities which fluctuate most are least important from the standpoint of weighting, if the sampling is fairly distributed, and if the number of commodities is sufficient, the simple averages may be employed where only approximate accuracy is necessary.

Where quantity or value data are available, weighted averages are usually much to be preferred. It is claimed by Fisher that a weighted average can be constructed which reduces the purely mathematical error to one-tenth or even one-hundredth of one per cent.[1] This high degree of accuracy is claimed for the so-called "ideal" formula which is written as follows:

$$\sqrt{\frac{\Sigma\, p_1\, q_0}{\Sigma\, p_0\, q_0} \times \frac{\Sigma\, p_1\, q_1}{\Sigma\, p_0\, q_1}}$$

These symbols may be defined in the manner indicated below:

p_0 = price of a given commodity at base period
q_0 = quantity of a given commodity at base period
p_1 = price of given commodity in given year
q_1 = quantity of given commodity in given year
Σ = sum of such quantities as the following

Some difficulty in using the formula arises both from the fact that it is somewhat laborious to compute and that it requires quantity data for the current year or the current month. A simplification may be adopted in the form

$$\frac{\Sigma\, (q_0 + q_1)\, p_1}{\Sigma\, (q_0 + q_1)\, p_0}$$

This formula is nearly as accurate as the ideal formula, and the speed of computation is much greater, but it is still open to the objection that quantity data for the current year or month are required. The formula employed by the Bureau of Labor Statistics and by numerous other authorities computing general index numbers is as follows:

$$\frac{\Sigma\, p_1\, q_0}{\Sigma\, p_0\, q_0}$$

This formula merely divides the total money value of a given quantity of goods in a base year into the total money value of the same quantity of goods in the given year. It compares the cost at wholesale of a constant bill of goods. In practice, the data for quantities may be taken from a year different from that employed as the base for the price index. For instance, when 1913 was the base year, the weights were drawn from the census data for 1919.[2] The resulting index number is sufficiently accurate for all practical purposes, is relatively easy to compute, and does not require quantity data as of the current month.

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[1] *The Making of Index Numbers*, p. 244.

[2] For a more complete analysis of the Bureau of Labor Statistics' index number of wholesale commodity prices, see the appendix at the end of the present chapter.

There are numerous other formulæ which give useful weighted index numbers. The geometric mean, employing constant values in a base year as weights, is satisfactory for certain purposes. Dun's index is a weighted aggregate in which the weighting is based upon the average annual per capita consumption of about three hundred commodities. It is unnecessary to go more exhaustively into the various possible formulæ. The above discussion is sufficient to suggest the kinds of problems which arise in the construction and interpretation of index numbers. The technical literature of the subject is voluminous and the interested reader may be referred to the brief bibliography given at the bottom of page 64.

The Purposes of Price Index Numbers.—The construction of an index number is inseparable from the purpose for which it is intended. Most of the technical questions which arise in making the index depend for their answer upon the use and interpretation to be made of it. In many cases it is possible to set up certain requirements of the index number by *a priori* reasoning. In other cases it is necessary to experiment with different forms of index numbers in order to determine which best meets the purpose. In some cases, although the purpose clearly requires a particular type of index number, complete data may not be available and some substitute for the best may have to be employed. There are listed below some of the common purposes to which index numbers of prices are put. It would take the discussion too far astray to discuss each purpose in detail.

(1) An index such as that of wholesale commodity prices prepared by the Bureau of Labor Statistics is often referred to as a *general purpose* index number.

(2) An index such as that by Warren Persons, including ten commodities, may be employed as an index of the business cycle.

(3) Index numbers may be used to deflate dollar value series, such as estimates of national income, national wealth, value of manufactures, or retail sales, with a view to estimating the physical volume of such series.

(4) It is often desirable to use index numbers for different places or different countries in order that regional comparisons of price changes may be made.

(5) Indexes of changes in the cost of living are often required.

(6) It is often necessary to reduce dollar incomes to so-called real incomes. For instance, nominal wages may be divided by cost of living indexes in order to estimate real wages; prices of farm products may be divided by prices of nonfarm products in order to give an estimate of farm purchasing power; or nominal interest rates may be adjusted for inflation or deflation in order that they may be expressed in the form of real interest rates.

(7) Early moving commodities may be segregated from the general group in order that they may serve as a barometer for the purpose of forecasting general price trends.

(8) The purchasing agent is interested in the course of certain individual prices in order that he may govern policies of hand-to-mouth buying or forward buying, as the case may require.

(9) Trade union contracts occasionally stipulate that wages shall be adjusted on a sliding scale to correspond with the fluctuations in the cost of living. In such cases, those responsible for collective bargaining require accurate indexes of local, regional and national cost of living changes.

(10) Rate making and valuation among public utilities involve some consideration, explicit or implicit, of changes in price levels.

(11) As a guide to private banking policy, to central bank policy and to fiscal policy on the part of the government, it is often necessary to ascertain whether inflation or deflation is taking place.

(12) Economists have usually been chiefly interested in index numbers which purport to measure the general purchasing power of money. The main concepts of purchasing power have been as follows: first, the purchasing power of money over labor; second, the purchasing power of money over a quantity of commodities; third, the purchasing power of money over a given amount of satisfaction; fourth, the purchasing power of money over all things and services whatsoever.

(13) Various proposals to stabilize the general price level have faced the necessity of deciding upon some specific index which would measure changes in the price level.

(14) Many economists have experimented with various types of index numbers in an endeavor to verify or disprove the quantity theory of the value of money.

(15) Many individual industries have set up special indexes for use within the industry. For instance, indexes have been computed of building costs, iron prices, hardware prices, and prices of electrical equipment.

Types of Price Movements.—Price movements may be thought of in reference to their long-term or short-term behavior. However, this twofold division leaves the notion of chronological variation in vague and abstract form. A concept of time series which will lend itself to quantitative or statistical analysis is highly desirable. Such a concept is found in the fourfold division—secular, seasonal, cyclical, and irregular variations.

The term, secular trend, is in some respects objectionable because it connotes growth; and, although prices rise and fall, this movement is not the same in character as a growth movement. The word, trend, connotes momentum and constancy of direction, either positive or negative. If these words are open to criticism on technical grounds we may substitute the expression long-time movement. Running through many irregularities, there is evident a general upward or downward drift of prices. Although there is no definite boundary line to the notion of what is long-time, nevertheless for practical purposes we may roughly say that a long-time movement is one which extends over a decade or more. Such movements are illustrated by the persistent fall of prices from 1873 to 1896 and the persistent rise from 1896 to 1914. (See chart on page 214.)

A seasonal or month-to-month price movement characterizes many individual commodities but is not appreciable in general averages. The all-commodity wholesale index of the Bureau of Labor Statistics, for instance, has no clearly discernible seasonal variation.

Cyclical variations refer to the alternating rise and fall of price indexes in some relation to periods of depression and prosperity. Although there is no regular periodicity of price cycles, nevertheless there is a sufficient similarity of sequence to make the recurrent ups and downs significant. (See charts on pages 169, 387.)

Irregular variations include any forms of fluctuation not included in the three forementioned forms. Price movements attributable to strikes, wars, floods, earthquakes, and other unusual occurrences would come under this category. As an illustration of irregular fluctuations, the extreme increases of prices during the World War period may be mentioned. (See charts on pages 159, 214.)

The Consequences of Price Fluctuations.—If price movements affected all social classes and all business interests uniformly, they would work relatively small injury. It is the inequality of gain and loss between various economic groups which gives rise to grave problems. One class of prices rises earlier than another, or at a faster rate, or to a higher peak. One class of incomes advances while another declines. One branch of industry adjusts itself quickly to price fluctuations, and another adjusts itself slowly. Varying periods of lag, shifting sequences, uneven amplitudes, characterize major price movements and create serious economic issues.

This general observation does not ignore the fact that if the price level were fairly stable, a certain normal churning around of individual groups and interests would still prevail. A price system is a dynamic structure in which some readjustment and some rearrangement is always in process. A stable price level would not mean a perpetual *status quo* in relative advantage of all groups in the money economy. But a disturbance sharply in excess of this normal dispersion of groups and classes may produce wide-spread inequities, and it is this extraordinary upset which is inseparable from a major rise or fall of prices. Hence in studying the importance of price movements, the point of view is the interrelations of the income groups, the social classes, the industrial units, and the diverse markets of the money economy.

Proceeding from this point of view, we need to consider the shifting interrelations of all these elements over periods of time. Hence we shall need to apply the concept of types of time variations previously presented, namely, secular, seasonal, cyclical, and irregular. For the purpose in hand, seasonal movements are too brief to have much significance, and may be ignored. The other types have serious consequences not only in proportion to the amplitude but also in proportion to the rapidity of their movement. A secular trend of the price level in the form of a 50-per-cent rise spread over a twenty-five-year period is much different in its economic consequences from a war-time rise of 50 per cent spread over a two-year period. A fairly rapid cyclical increase which continues for only a year or two, stands in contrast with a secular increase which persists for a decade or more. A rise or fall of 1 per cent per month is a much more serious phenomenon than a rise or fall of 1 per cent per annum. With these notions of time variation in mind, we may examine some of the specific classes and groups which suffer or benefit from the swings of the general price level.

(1) *Debtors vs. Creditors.*—Inasmuch as modern business proceeds by borrowing or lending, any disturbances to the equitable relations between debtors and creditors immediately become a matter of grave importance. If a creditor makes a loan of $100,000, and the general level of prices is doubled, the proceeds at maturity will be the same number of dollars of principal as were originally loaned, but only one-half the purchasing power. Interest receipts as well as principal sum will entail loss to the creditor from this depreciation of purchasing power. Conversely, the creditor's loss will be the debtor's gain. When the price level is rising, the debtor borrows dollars of high purchasing power and returns dollars of low purchasing power. The tables are reversed in case prices fall. Then the debtor loses and the creditor gains. If the bulk of business were done on a cash basis, these inequities would be avoided. But the essence of a money economy is the conduct of business on a credit basis. Consequently inequity between creditor and debtor strikes at the heart of the system.

Let us take for illustrative purposes the gain or loss involved over both long and short periods in the ownership of government

TABLE II

PRICE FLUCTUATIONS AND BRITISH CONSOLS

Year	Purchasing Power of the Income of Consols	Purchasing Power of the Capital Value of Consols
1815	61	56
1826	85	92
1841	85	104
1869	87	111
1883	104	144
1896	139	208
1914	100	100
1920	34	22
1921	53	34
1922	62	47

bonds. British Consols may be selected as an example of the highest type of *safe* investment. The following table prepared by J. M. Keynes shows fluctuations in the purchasing power of principal and income over a period of more than a century.[1]

Interpreting these estimates, Keynes declares:

> The loss to the typical English investor is sufficiently measured by the loss to the investors in Consols. Such an investor was steadily improving his position, apart from temporary fluctuations, up to 1896, and in this and the following year two maxima were reached simultaneously—both the capital value of the annuity and also the purchasing power of money. Between 1896 and 1914, on the other hand, the investor had already suffered a serious loss—the capital value of his annuity had fallen by about a third, and the purchasing power of his income had also fallen by nearly a third. The owner of Consols in 1922 had a real income one-half of what he had in 1914 and one-third of what he had in 1896.[2]

The same problem may also be illustrated by some estimates of Irving Fisher. A study of selected bonds from 1866 to 1885, a period of falling prices, indicates that, although the nominal yield was 6.8 per cent, the actual yield measured in purchasing power was 11.7 per cent. On the other hand, during the period from 1901-1922 when prices were rising, the nominal yield on a list of selected bonds was 4.0 per cent, whereas the real yield was only 1.1 per cent.[3] Falling prices resulted in extraordinary gains to the investor, whereas rising prices reduced his yield almost to the vanishing point.

Consols, bonds, *rentes*, and annuities represent long-term contracts and are specially affected by long-time movements in the purchasing power of money. Notes and instruments running for a few months are not materially affected by the long-time movements, since the degree of change in the price level between the creation and liquidation of such contracts is small. However, when short-term violent price disturbances appear, as in cyclical and war-time fluctuations, both long-term and short-term contracts suffer. Even in such variations, however, long-term contracts commonly feel the disturbance relatively more than short-term, simply because the former suffer the cumulative shock of price changes, whereas the latter suffer only the shock which occurs within the few months between original loan and maturity.[1]

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[1] *Monetary Reform*, 1924, p. 18.

[2] *Ibid.*, 1924, pp. 16–18.

[3] *Magazine of Wall Street*, April 25, 1925.

The total volume of long-term contracts in the United States can be estimated only in very approximate form. According to estimates by Carl Snyder in December, 1925, there were in existence approximately one hundred billion dollars of corporation bonds and mortgages, federal, state and municipal government bonds, and farm and urban real estate mortgages.[2] The bulk of such securities have maturity dates sufficiently far off so that secular trends of prices seriously upset the relations between debtors and creditors.

The depositor in a savings bank suffers in essentially the same way as the owner of a gilt-edged bond. If a workingman in 1896 had set aside $1,000 in a savings account and in 1920 had taken out the accumulated compound interest and the principal, this combined sum would not have purchased as large an amount of goods and services as the original $1,000 would have purchased in 1896. The reward for thrift would have been negative. If the rate of interest on a savings account is established at 3 per cent and prices rise at the rate of 3 per cent per annum, the depreciation of purchasing power of the principal sum on deposit will approximately cancel the interest received. If prices rise at a rate materially in excess of 3 per cent per annum, the depositor receives negative interest. That is to say, instead of being rewarded for saving, he takes a net loss.

The inequities which have been outlined with respect to bonds, mortgages, and savings deposits might be illustrated almost indefinitely in other forms of investment, saving and ownership. Beneficiaries of life insurance policies, recipients of pensions and annuities, educational and philanthropic institutions dependent upon endowments, holders of long-term leases on real property, recipients of income from estates held in trust and the heirs to hereditary fortunes—all of these groups suffer an unmerited loss during periods of rising prices. W. I. King has estimated that during the period 1914-1920 the unjust transfer of ownership and income in the United States amounted to something like sixty billion dollars of 1920 purchasing power.[3]

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[1] See KIRSHMAN, J. E., *Principles of Investment*, 1925, pp. 135–137, 232–235, 650–653, 724–738, 755–774.

[2] *American Economic Review*, vol. XV, pp. 684–700.

[3] *The American Economic Review*, December, 1920, p. 746.

The injustice which occurred in the United States during the War period was small in proportion to the loss suffered by many European countries where the inflation of prices went to violent extremes. In Germany, for instance, the thrifty people who had built up savings accounts or invested in so-called "safe bonds" lost more than 99 per cent of their holdings. The lifetime savings of working classes and middle classes were wiped out. Such results make thrift an empty mockery. It is preposterous to ask people to accumulate capital if they face the possibility of almost complete destruction of the value built up out of sacrifice and abstinence.

The shrewd investor may attempt to defend his savings against unjust losses by certain expedients. For instance, he may insist upon a higher rate of interest as a form of insurance against loss, or, what amounts to the same thing, he may offer a lower price in the market for securities. Although this action may forestall future losses, nevertheless it will not compensate for the losses that have occurred on investments already made. It is not a retroactive defense mechanism. Also, in anticipation of inflation, the investor may sell bonds and mortgages and purchase common stocks and real property. This scheme, if adopted in time, would protect the first individual but would merely shift the burden of loss to some second individual. Investors as a group could not save themselves from loss by this plan. An extension of this device of shifting investment is found in the proposition advanced by some observers that under any and all conditions, but especially under price inflation, common stocks are a safer investment than bonds. Various studies have been made which warrant the tentative inference that when prices are rising a diversified list of common stocks is much superior to bonds from the standpoint of assurance of real yield and of sustained purchasing power of the market value of the security.[1]

Many corporations protect themselves against loss arising from depreciated money by inserting call features in securities. They can then recall outstanding securities at a specified price and substitute therefor new securities bearing a lower net yield. During rising prices corporations commonly declare stock dividends and thereby add to their capitalization without any increased stock purchases by proprietors. Among other advantages, this device enables the corporation to disburse the larger dollar volume of profits appropriate under conditions of inflation without any advance of the dividend rate and, hence, without exposing the corporation to unjust accusations of profiteering. For instance, let us assume that in a base period, a corporation pays dividends of 10 per cent ($100,000) on common stock of $1,000,000. Let us further assume that prices have since risen 50 per cent. The sum of $150,000 will now be required to equal the former purchasing power of $100,000. But to disburse the large sum on the same capitalization would mean a dividend rate of 15 per cent. If a stock dividend of 50 per cent is declared, then the new dollar dividends can be disbursed at the old rate of 10 per cent. Stockholders are receiving no more real purchasing power than formerly, and the corporation is not placed in the false light of profiteering. Still another protective device is the insertion in contracts of a clause stipulating that payment shall be made in "gold dollars of present weight and fineness." This precaution is an outgrowth of the attempt by debtors during and after the Civil War to pay their debts in depreciated greenbacks. The Supreme Court of the United States in 1868 (Bronson *vs.* Rodes, 7 Wallace, 229) held that contracts which specifically stipulated payment in gold could not be settled by debtors by an offer of depreciated paper currency. Gold contracts are therefore safe against paper inflation. They are not, however, safe against gold inflation. For instance, in 1927, a debtor could pay a gold contract made in 1913 by offering the same number of dollars as he originally borrowed, but the purchasing power of those dollars in 1927 would have been only about two-thirds that in 1913.

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[1] See, for instance, FISHER, IRVING, *How to Invest When Prices Are Rising*, 1912; POMEROY, R. W., *Stock Investments*, 1923; SCUDDER, STEVENS and CLARK, *Investment Counsel*, 1922; SMITH, EDGAR, *Common Stocks as Long-Term Investments*, 1924; VAN STRUM, K. S., *Investing in Purchasing Power*, 1925.

The same individual or corporation may often gain in various capacities and lose in other capacities at one and the same time. For instance, an individual may lose on some stocks and bonds and cancel the losses by gains on others. If the individual's interest as debtor and creditor cancel, obviously neither rising nor falling prices can bring him much harm. However, this ideal situation is exceptional and cannot be relied upon to eliminate injustice from the general situation. It is sometimes claimed that gains cancel losses, since even though creditors lose during rising prices they nevertheless gain during falling prices. In the long run, it is said, the benefits of one period offset the injuries of another. Although as a purely mathematical proposition things may average out in this manner, nevertheless the true ills and benefits of the process do not come within the four corners of a mathematical proposition. There is no guarantee that the same individual who suffered loss at one time will recapture an equal gain at another time. Moreover there is a net loss in the form of unbalanced production, unemployment, and social friction which cannot possibly be cancelled by subsequent developments. In general, the conclusion is inevitable that immoderate price fluctuations are a fundamental injury to the community.

(2) *Business Enterprise.*—The corporation is a large-scale borrower and debtor. The nonparticipating bonds and preferred stocks outstanding, and the commercial loans from the banks impose upon the corporation the obligation to meet interest payments, accumulate sinking funds, and pay off maturing principal sums. When prices are rising, the corporation as debtor pays in dollars of depreciated purchasing power. Thus, the corporate debtor gains what the creditors lose.

The corporation set-up results in the realization of this gain by the proprietary interests, that is, the holders of common or preferred stocks which have rights to participate in unusual earnings. Thus, during rising prices, the proprietors benefit at the expense of the bondholders and other creditors. Conversely, during falling prices, the proprietors lose whereas the creditors reap corresponding gains. These results accrue not from any perversity on the part of individuals but from the change in the measuring-stick of value.

Large groups of business men gain or lose from another feature of price fluctuations, namely, the varying margin between cost prices and selling prices. During a price advance, business men buy goods at today's low prices and sell them at tomorrow's high prices. Expense factors, to the extent that they lag behind selling prices, yield a windfall of gain which is attributable solely to the fall in general purchasing power of the dollar. During falling prices, this situation is reversed. Hence, it is commonly recognized that rising prices stimulate business activity whereas falling prices retard it.

The gains and losses due to price movements are by no means uniform among all industrial groups. For instance, during rising prices public utilities commonly face restriction of their rates by public service commissions although their cost items are advancing. Some industries are unable to advance selling prices as fast as others because of the force of custom or the price practices prevailing. Unequal elasticities of supply and demand lead to sharp price discrepancies between individual commodities. Obviously not all forms of industry benefit from rising prices, and the forms which do, benefit very unequally.

Such unusual profits as accrue from rising prices often incite observers to accuse the business classes of profiteering. Law makers and courts try to suppress high earnings by legal coercion. Agitators cry that business men generally are exploiting the public. But such attacks are largely futile, since they rest on the assumption that profiteering is a manifestation of special avarice and cupidity; whereas in fact it is a chance windfall automatically resulting from the depreciation of money. Profiteering is effect, not cause, of inflation. Moreover, the amount of real profit is usually exaggerated. If a business earns twice as many dollars of profit now as formerly, this looks superficially like profiteering. But if the purchasing power of the dollar has fallen one-half, the real profits, measured in terms of their purchasing power, have remained unchanged. If originally the business was paying dividends of 10 per cent on $1,000,000 of common stock, now that earnings have doubled it can pay 20 per cent on $1,000,000. But this rate would appear excessive and might open the corporation to accusations of profiteering. The problem of disposing of the extra dollar earnings suggests two lines of procedure. The corporation can plough the new earnings back into the business by setting them aside to surplus and reinvesting them in the enterprise. Or it can declare a 100-per-cent stock dividend, thus raising the common stock to $2,000,000 and then pay 10 per cent as usual on the new capital sum. Both of these devices were widely used by corporations in the United States during the decade following 1914. According to a report of the Federal Trade Commission, between 1920 and 1927, stock dividends were declared by 10,245 corporations to the amount of over $6,250,000,000. This sum was more than 45 per cent of the total dividends of these corporations.

These phenomena will vary with the type of time movement which is under consideration and with the rate at which the movement takes place. A slow secular trend of prices up or down may have a scarcely appreciable effect on business prosperity. A long-time fall which does not exceed, let us say, one per cent per annum may have little depressing effect on business, whereas a fall of five per cent per annum may have disastrous effect.[1] The actual history of a century and a third of prices

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[1] The views of Alfred Marshall on the issue here discussed are of deep interest:

"I agree with the general opinion that a steady upward tendency in general prices conduces a little more to the general well-being than does a tendency downwards, because it keeps industry somewhat better employed. But, on the other hand, people of all classes, and especially of the working classes, spend their incomes more wisely when prices and money-wages are falling, and they think themselves worse off than they are, than when a rise of prices and money-wages leads them to exaggerate their real incomes and to be careless about their expenditure. So that, on the whole, I think there is much less difference than is generally supposed between the net benefits of periods of rising and falling prices. . . . In fact, I regard violent fluctuations of prices as a much greater evil than a gradual fall of prices.

"I think that the general interests of the country are best promoted by stationary prices; but that the benefits resulting from a rise in prices and the evils resulting from a fall of prices are commonly over-rated; and in fact I think it is not clearly established that a rise of prices is on the whole to be preferred to a fall. . . .

"Looking at the periods in England in which there has been the greatest distress, I find that they are periods of rising prices. There has never been, I think, anything like as much distress in England as under the later Tudors and at the beginning of this century; and in each of these periods prices were rising very fast. . . . I think that one wants very much stronger statistical evidence than one yet has to prove that a fall of prices diminishes perceptibly and in the long run the total productiveness of industry. Supposing that it does not diminish considerably the total productiveness of industry, then its effect is, I think, on the whole good; because it certainly tends to cause a distribution of wealth better than that which we should otherwise have. No doubt some rich lenders of money in the form of debentures and other ways get their incomes increased at the expense of the public, which I regret; but the greater part of the redistribution is in the direction of giving higher real wages and real salaries to the employes, and that, I think, is a gain. If then a fall of prices has the effect of not much altering the total amount of production, but putting more real value into the hands of the poorer classes, I regard it so far, not as a loss to the country. . . .

"I stated that the two periods of greatest distress that I knew were two periods of rapidly rising prices. I do not mean that in every period of rising prices there has been distress.

"*You mean to say then that there have been periods of rising prices when there has been great prosperity?*—Yes, but I think that the prosperity has been caused by other things, and I think the real prosperity has not been greater than it would have been if prices had not risen so fast. I think the rise of prices has caused the apparent prosperity to be much greater than the real; has caused an immense number of incompetent persons to get into the control of a business which they cannot manage except when prices are rising. As soon as prices fall, and sooner or later they must fall, these people fail, and their failure reacts on and prosperity in England and the United States supports the hypothesis that rising and falling secular trends of prices have, to a material extent, influenced good and bad times in business. During periods when the secular trend of prices has been downward, slightly less than half of the time can be classed as prosperity, slightly more than half as depression. When the secular trend of prices has been upward, about three-fourths of the time can be classed as prosperity, about one-fourth as depression.[1] There seems little doubt that the relative duration of prosperity and depression is definitely influenced by the secular trend of prices.

The cyclical as well as the secular fluctuations of prices are closely associated with the alterations of good and bad business. Many students of the business cycle have adopted an index of wholesale prices as the best single index of business activity. This matter is discussed at length in Chapters XVIII and XIX.

The irregular fluctuations of prices associated with major wars have had profound business consequences. A violent inflation of prices for a time excites furious activity, extraordinary money profits in many lines of industry, and extreme speculative commitments. Subsequently, a violent deflation wipes out money gains, precipitates depression and unemployment, and inflicts tremendous moral and pecuniary loss on practically all economic classes. The experience has been fundamentally the same, whether associated with the Napoleonic Wars, the Civil War, or the World War.

(3) *Agriculture.*—Price fluctuations affect the prosperity of agriculture more acutely than they affect many other lines of business. This relatively extreme susceptibility of agriculture to the gains and losses of price upheaval is well illustrated by the record of events during and after the World War. Farm prices rose violently from 1914 to 1920 and fell violently in 1920 and 1921. The discrepancies between farm prices and other prices

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others and causes widespread distress. That is what I regard as the chief evil of a sudden rise of prices, the premium it gives to incompetent business men, enabling them to retain the control of concerns which they do not manage well, and which collapse as soon as the artificial support of rising prices is taken away." MARSHALL, ALFRED, *Official Papers*, 1926, pp. 9, 19, 90, 91, 97, 98.

[1] These estimates are based upon the data obtained by W. L. Thorp and published in W. C. MITCHELL's *Business Cycles*, 1927, p. 411.

and between farm income and other income were unusually severe. In 1922, it is estimated that farm taxes were about 126 per cent above the pre-War level, whereas the prices of the food products which the farmer had to sell were only 24 per cent above. When farm lands were selling at high prices in 1918-1919, about 10 to 20 per cent of the acreage changed ownership. The new owners assumed heavy mortgages, and as soon as prices of farm products collapsed, they were forced into bankruptcy. From 6 to 20 per cent of farm owners, depending upon the region concerned lost their farms.

The discrepancy between freight rates and farm prices was so great in 1922 that about 30 per cent more in food products was necessary to pay freight than in 1913. The discrepancy between agricultural prices and nonagricultural prices was so great that whereas in 1919 the purchasing power of farm products in terms of nonfarm products at wholesale (farm index divided by nonfarm index) was 107, it was only 89 in 1920, 72 in 1921, 74 in 1922, and 80 in 1923. The prices of the products the farmer had to sell declined much more than did the prices, either at wholesale or at retail, of those he had to buy. To buy farm machinery in 1922-24, from 50 to 70 per cent more of the physical product of the farm was required than before the War.[1]

If we inquire into the causes for excessive injury to agriculture during such price fluctuations, we discover that this industry is unable to adjust production promptly to changed price conditions. The overhead cost is relatively heavy; the labor force, consisting largely of the farmer's own family, cannot be discharged; the farm *entrepreneur,* being a very small-scale operator, cannot control production on a sufficient scale to manipulate prices; the production period is so long and the rate of turnover is so slow that current adjustments of production volume are extremely difficult. The inelasticity of supply of agricultural products prevents that industry from shunting the ills of falling prices to some other economic group.

The post-War farm situation reflects both an abnormal war influence and a normal business cycle influence. The more normal relation of agriculture to the business cycle can be observed by

[1] Most of the data on farm prices are drawn from *The Agricultural Situation,* 1924, by G. F. Warren and F. A. Pearson.

studying pre-War cycles. Farm prices there followed a relatively independent course. They primarily reflected changes in temperature, rainfall, and crop conditions, rather than the recurrent swings of trade boom and depression. Some authorities have advanced the hypothesis of a climate-crop cycle, but this is not to be confused with the business cycle as such.[1]

The history of secular trends of prices of farm products and of nonfarm products suggests the tentative hypothesis that agriculture benefits from slowly rising prices and suffers from slowly falling prices. From 1899 to 1913, all wholesale commodities rose about 27 per cent, whereas farm commodities rose about 56 per cent. Simultaneously, the proportion of the total national income going to agriculture rose from 14.1 per cent to 16.5 per cent.[2] The situation was reversed in the preceding period of falling prices. The farmers' share of the national income diminished.[3] The burden of mortgages and public debt on the farmer became oppressive since he was obliged to pay in dollars of large purchasing power in order to settle contracts made in dollars of low purchasing power. The West railed against the "bloated bond-holders" and the "gold-bugs" of Wall Street and supported the cause of easy money and free silver.[4]

(4) *Wage Earners.*—From 1896 to 1914, the average annual real earnings of employed workers were approximately stationary both in England and the United States. Since the national income was growing during this period, and the labor income was approximately stationary, it follows that labor tended to receive a smaller share of the national income at the end of the period than at the beginning. Similar comparisons for periods of long-time increases and decreases of prices from 1820 to 1920 indicate that real wages (daily and weekly earnings corrected for changes in the cost of living) move inversely with the general price level. Real wages increase with falling prices and decrease with rising prices. In consequence labor's share of the national income tends

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[1] See, for instance, MOORE, H. L., *Economic Cycles: Their Law and Cause*, 1914; also, by the same writer, "Generating Cycles of Products and Prices," *Quarterly Journal of Economics*, vol. XXXV, 1921.

[2] EDIE, L. D., *Economics, Principles and Problems*, 1925, pp. 321, 331.

[3] *Agricultural Problems in the United States*, National Industrial Conference Board, 1926, p. 48.

[4] For a summary of the experience of agriculture in the United States since 1790, see HANSEN, A. H., "The Effect of Price Fluctuations on Agriculture," *Journal of Political Economy*, vol. XXXIII, 1925, pp. 196–216.

to improve when the secular trend of prices is downward, and to diminish when the secular trend of prices is upward.[1]

With respect to the business cycle, the evidence available points to the theory that the total income or purchasing power of labor as a group rises with prosperity and rising prices, and falls with depression and falling prices. The total purchasing power of labor involves not merely the ratio between wage rates and cost of living at successive stages of the business cycle, but also the fluctuations in labor employment. During the boom phase of the cycle, normal wage rates tend to lag behind rising prices; but the volume of employment increases materially with the result that total payroll disbursements undergo a marked improvement. Conversely, during the depression phase of the cycle, normal wage rates tend to stay up although commodity prices are falling, but the heavy increases of unemployment result in a considerable loss in total payroll disbursement. This differentiation between wage rates and total wage income is essential to an understanding of the effect of cyclical price changes upon wage earners. Moreover, the fluctuations in employment must be broken into their elements. There is a substantial portion of the labor group which enjoys fairly permanent employment. In bad times, as well as in good, steady and efficient labor holds the job. Variations in employment are largely confined to a certain marginal group which may be termed the cyclically employed. They in large measure are the less efficient workers and hence the ones to be first discharged during depression. They bear the brunt of the fluctuations of the business cycle.

After the Napoleonic Wars, the Civil War, and the World War, wages resisted the post-War deflation of prices. Wage rates lagged behind prices during the War-time increase, but they also lagged behind prices during the post-War decrease. The net result in each case was a considerable improvement in real incomes of wage earners. This outcome is clearly illustrated in the period following the World War. At the end of 1927, weekly earnings of factory workers were estimated to be about 120 per cent above the 1913 level, whereas the cost of living was only about 70 per cent above that level.

The above discussion does not concern itself with the social and moral effects of price changes. In any complete discussion of the problem these effects are of fundamental importance, but we are concerned here chiefly with the economic consequences in terms of real wages and employment.

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[1] Douglas, Paul H., *The American Economic Review Supplement*, vol. XXVI, March, 1926, pp. 17–54; Hansen, Alvin H., *The American Economic Review*, vol. XV, March, 1925, pp. 27–48.

(5) *Public Utilities.*—During the long-time fall of commodity prices before 1896, railroad freight rates probably declined somewhat more rapidly than prices, and during the climb of prices after 1896 freight rates lagged behind the price movement. In the business cycle freight rates are highly inelastic. The fact that they are regulated by the Interstate Commerce Commission prevents either prompt or automatic adjustment to short-time changes in prices. During the period of the World War, freight rates were not raised until late in the period of inflation and the per cent of increase was materially less than that of prices. During post-War deflation freight rates again lagged in the downward adjustment.

The position of public utilities with respect to price fluctuations involves changes both in the rates of return and in the valuation of properties. Although some legal and economic authorities have advocated a flexible adjustment of rates on customer service and a fair return on fair value of properties to correspond with changes in commodity prices, nevertheless for the most part this plan has been very inconsistently incorporated in public utility regulation. Such adjustments of rates as are made are halting and unsystematic. Since the World War, a great deal of attention has been given to the problem of adjusting valuation to changes in price levels. The technique of public utility valuation is much too complicated to permit adequate discussion of the problem in the present volume. However, certain phases of the matter may be mentioned for the sake of suggesting the great importance of price fluctuations in any attempt at arriving at a fair value of utility properties.

In the famous Supreme Court decision in the case of Smyth *vs.* Ames, the following criteria of valuation were laid down:[1]

> We hold, however, that the basis of all calculations as to the reasonableness of rates to be charged by a corporation maintaining a public highway under a legislative sanction must be the *fair value* of the property being used by it for the convenience of the public. And in order to ascertain that value, the original cost of construction, the

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[1] 169 U. S. 466, 546 (1898).

> amount expended in permanent improvements, the amount and market value of its bonds and stock, the present as compared with the original cost of construction, the probable earning capacity of the property under particular rates prescribed by statute, and the sum required to meet operating expenses, are all matters for consideration and are to be given such weight as may be just and right in each case. We do not say that there may not be other matters to be regarded in estimating the value of the property. What the company is entitled to ask is a fair return upon the value of that which it employs for the public convenience. On the other hand, what the public is entitled to demand is that no more be exacted from it for the use of a public highway than the services rendered by it are reasonably worth.

This decision makes no explicit reference to the effect of changing price levels upon valuation, but it has been relatively easy for subsequent courts to read into these general criteria a doctrine of valuation which takes into account the price factor. In 1923, the Supreme Court of the United States in The Southwestern Bell Telephone case rendered the following opinion:[1]

> It is impossible to ascertain what will amount to a fair return upon properties devoted to public service without giving consideration to the cost of labor, supplies, etc., and at the time the investigation is made an honest and intelligent forecast of the probable future values made upon a view of all the relevant circumstances is essential. If the highly important element of present costs is wholly disregarded, such a forecast becomes impossible. Estimates for tomorrow cannot ignore prices of today.

It is to be noted that this decision requires not only that past and present price changes shall be taken into account by public service commissions, but also a forecast of probable future prices.

Much of the same viewpoint was expressed by the Supreme Court of the United States in 1926:[2]

> But in determining present value, consideration must be given to prices and wages prevailing at the time of the investigation; and, in the light of all circumstances, there must be an honest and intelligent forecast as to probable price and wage levels during a reasonable

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[1] *State of Missouri, ex rel. Southwestern Bell Telephone Company v. Service Commission of Missouri, et al.*, 43 Sup. Ct. 544 (1923).

[2] *John W. McCardle et al. v. Indianapolis Water Company*, 47, Sup. Ct. Rep. 144 (1926).

period in the immediate future. In every confiscation case, the future as well as the present must be regarded.

The Interstate Commerce Commission has not been explicit in incorporating an allowance for price fluctuations in railroad valuations. However, in the O'Fallon case, the Commission made the following observation on the outcome of its principles of valuation:[1]

> Whatever the price level may be, however severe the fluctuations, this method will result in yielding a fair return on every dollar invested and remaining in the property.

This is a clear recognition that price fluctuations are necessary considerations in the valuation process.

A special feature of valuation discussions is the contrast between original cost and reproduction cost as valuation bases. During a period when prices have risen, the utilities seek the adoption of a reproduction cost basis since this will permit an increase in valuation. However when prices are falling, it would seem inevitable that utilities shift their standard of valuation to the original cost basis. If they did not do so, they would soon reach a position where valuation would be less than the original cost and bankruptcy would be imminent.

(6) *Taxation and Public Debt.*—During the era of rising prices following 1913, considerable alarm was felt over the increase in the burden of taxation. There frequently appeared estimates of the per capita burden of taxation at successive periods which purported to show remarkable increases. Such estimates were often misleading because they did not take into account the change in the purchasing power of the dollar. If taxes rise 50 per cent, and prices rise about an equal amount, the net result is no change in the real tax burden. Hence, it is important in all estimates of the growth of taxation to deflate dollar-value estimates according to changes in the purchasing power of money. When such deflation is made, there remains a material advance in real taxes, but the advance is nothing like the exaggerated estimates which omit an adjustment for the change in the value of money.

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[1] *Excess Income of St. Louis and O'Fallon Railway Company*, Finance Docket No. 308 and *Excess Income of Manufacturers' Railway Company*, Finance Docket No. 4026 (Feb. 15, 1927).

The growth in volume of real taxes is not distributed equally among all classes of taxpayers. *Ad valorem* customs duties and excise taxes are automatically adjusted to the changed purchasing power of the dollar because they are computed on the basis of a percentage of the money value of commodities at any given period.

Under the general property tax, on the other hand, the adjustment to changes in prices is often imperfect. If prices are rising, appraisals of property lag behind prices; but when the fall of prices ensues, high property values tend to maintain themselves in spite of the fall. This discrepancy has worked special hardship upon farm owners in the post-War period when they were required to pay taxes on high land appraisals long after the market value had slumped. Under the income tax, when prices are rising the taxpayer pays the government in dollars whose purchasing power has depreciated as compared with the purchasing power of money at the time the income was earned. Many other inequalities in the incidence of taxation under rising and falling prices might be cited, but these examples are sufficient to suggest that fluctuations in the purchasing power of money shift the burden, now one way, now the other, without regard to equity or ability to pay.

A phase of the fiscal problem which has been of special interest in the post-War period has been the effect of price deflation upon the burden of international debts and reparations payments and of internal public debts. The Dawes plan recognized that a change in the value of money might alter the nature of Germany's capacity to pay and of the purchasing power of the amount received by the Allied governments. The following clause was inserted in Annex Number 2 of the report of the first Committee of Experts:

> The German Government and the Reparation Commission should each have the right in any future year, in case of a claim that the general purchasing power of gold as compared with 1928 has altered by not less than 10 per cent, to ask for a revision on the sole and single ground of such altered gold value.

European countries which endeavored to return to the gold standard after the World War faced the necessity of deflating internal prices to a parity with world gold prices. However, such deflation worked hardship upon those classes which were required to pay off the war debts, because the internal fall of prices forced taxpayers to pay off in units of an enhanced purchasing power public debts which had been incurred in units of low purchasing power. In the event that money should gradually appreciate in value during the second quarter of the twentieth century, the burden of both international and internal debts would increase seriously, and doubtless great pressure would be brought to bear for the scaling down of international debts, and great political battles would be fought over terms and methods of payment of internal debts.

A Stable Unit of Account.—The most reasonable hypothesis upon which to proceed is that an approximately stable unit of account is a sound objective of monetary policy. This does not imply that absolute fixity and stagnation of price levels can or should be adopted. It does, however, assume that relative stability is a sound goal toward which to strive. In order to determine the practicability of such a proposal, it is necessary to analyze the various factors which govern the value of money. This requires a theory of the movement of the general level of prices. To the development of such a theory much of the remainder of this volume will be devoted.

APPENDIX

THE INDEX OF WHOLESALE PRICES

By Ethelbert Stewart, U. S. Commissioner of Labor Statistics[1]

This is the fourth form of a wholesale price index launched by the United States Bureau of Labor Statistics.

In the compilation of the first, in so far as any method was used, it was that of Sauerbeck. The price base had a spread of ten years, being the average of prices from 1890 to 1899. The Sauerbeck system amounts to an index based upon an average of relatives, and the element of weighting as we understand it now is entirely ignored. The less said about that index the better.

It was entirely discarded in 1913, and a new and weighted index was compiled. This was first published in 1914 in Bulletin No. 181. In it a system of weighting the money prices of commodities by their physical quantities sold in the markets was introduced for the first time in the United States, and the aggregative method of computation was employed. The aggregative method had been advocated for a number of years by G. H. Knibbs, of Australia, and was probably first actually put into practice by him. The older indexes, like the Bureau's old index, were based either upon the Sauerbeck method, or on other methods more or less kept as secrets.

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[1] *Monthly Labor Review*, U. S. Bureau of Labor Statistics, vol. XXV, December, 1927, pp. 46–52.

The 1914 index covered 297 articles or price series. They were weighted by the census data of 1909, and the price base chosen was the average of the prices for the year 1913.

A revision of this index was made in 1921, and the number of commodities was increased to 404. Prices were weighted by the then new 1919 census data instead of the census data of 1909, and the index numbers for all back years were revised accordingly. The base price of 1913 was retained, and at this time the plan was adopted of including in two different commodity groups such articles as properly belong to both groups. Thus structural steel, nails, and certain other metal products used in building were placed in the group of building materials as well as in that of metal products. Similarly, food articles produced on the farm, and which reach the consumer unchanged in form, such as potatoes, eggs, and milk, were included both among farm products and among foods. In computing the general index number for all commodities, however, such articles were counted only once, thereby avoiding duplication in the final results. Again all index numbers were revised back to 1890. These index numbers were continued to August of the present year.

In the Bureau's latest revised index numbers, the results of which have recently been announced, the number of commodities has again been increased—this time to 550. This was done in order to give representation to certain commodities, such as automobiles, which now loom up large in the country's commerce but which formerly were unimportant. Other important commodities have been added, such as farm machinery, family sewing machines, cookstoves, byproduct coke, manufactured gas, and prepared fertilizers, prices for which have only recently become available to the Bureau. All of these articles have been added in the effort to make the Bureau's wholesale-price index represent as large a cross section of the country's commerce as it is possible to accomplish under present conditions.

On the other hand, a few articles carried in the index of 1921 have been discarded for the reason that their use has been superseded by other types of commodities. A striking instance of this is clay worsted, which is no longer used to any appreciable extent in the manufacture of men's clothing.

Distribution of the articles or price series among the various groups under the revisions of the Bureau's index number is as follows:

NUMBER OF ARTICLES OR PRICE SERIES IN EACH COMMODITY GROUP IN UNITED STATES BUREAU OF LABOR STATISTICS' INDEX NUMBERS OF 1913, 1921, AND 1927

Commodity group	1913	Revision of—	
		1921	1927
Farm products	30	56	67
Foods	87	[1]111	[1]121
Cloths and clothing	72	65	....
Hides and leather products	....	....	40
Textile products	....	....	75
Fuel and lighting	15	20	23
Metals and metal products	25	37	73
Building materials	30	[1]41	[1]57
Chemicals and drugs	10	43	[1]78
House-furnishing goods	6	31	[1]37
Miscellaneous	22	25	25
Total	297	429	596

The new index uses as a weighting factor the average of the censuses of 1923 and 1925 for manufactured products, and for agricultural products the averages of 1923, 1924, and 1925. Wherever reliable data could be secured for the mid-census year of 1924 these were used in the adjustment of the weighting factor. In the matter of agriculture I think we must concede that the variation in volume of crops is so great that a somewhat broader base for the weighting factor is desirable. Having accepted the broader time base for the weighting factor of agricultural products, I accepted in the interest of uniformity a broader time base for the weighting factor of all commodities. The price base has been changed from the average of 1913 to the average of 1926. The principle of an average for one year as the price-base line has not been abandoned.

Some rearrangement of commodities has been made with respect to certain groups. Thus hides, which now are almost entirely a packing-house output, have been removed from the farm-products group and assigned to the newly added group of hides and leather products. To this group also belong shoes, formerly with cloths and clothing, and leather, formerly in the miscellaneous group. The new group of textile products includes all of the former cloths and clothing group with the exception of shoes; also, it includes manila hemp, jute, rope, and Mexican sisal, formerly carried in the miscellaneous group. It also includes two new commodities—binder twine and burlap.

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[1] Includes certain commodities classified also in another group.

For a number of commodities composite prices are now being used, instead of prices from a single source. This applies to leather harness, suitcases, and traveling bags, anthracite and bituminous coal, manufactured gas, plows, automobiles, sewing machines, cookstoves, brick, Portland cement, prepared fertilizers, furniture, and automobile tires. In all cases simple averages of the prices obtained from different sources have been made in order to arrive at the composite prices. To preserve the continuity of the information, care is taken that the quotations for any month be obtained from the same sources and on articles of the same description as the month before. These composite prices are believed to furnish a more accurate barometer of price changes than would prices based on a single source of information. For example, monthly prices of building bricks are obtained from 82 manufacturers in different parts of the country. These 82 prices are averaged to obtain the composite price. No attempt is made to weight the different elements entering into any composite price, since in most cases it would be a physical impossibility to arrive at the quantity of the article sold at the reported price. In a few instances, where the reported prices were regarded as truly representative, the composite price has been made from only three quotations, but in no case from less than three. In all cases the prices, whether individual or composite, have been weighted by the quantities of the article marketed in the three years 1923, 1924, and 1925, or in the case of manufactured products, by the average for 1923 and 1925.

In addition to the simple composite price we have, as in the case of automobiles and several other commodities, what might be considered a weighted composite price. We carry six automobiles—Ford, Chevrolet, Dodge, Buick, Cadillac, and Packard. We get the price of each type of Ford passenger car sold in a month, for example. From this we make an unweighted average price, since it has been found impossible in practice to ascertain the volume of sales for each type of car. We do this for each of the six makes. Then, to get the composite price used in the weighted index, we proceed as follows: The total production of all makes of passenger cars in the base weighting period 1923-1925 is divided into six parts according to the relative volume of sales in 1926 of the six makes as compared with each other. In other words, the six makes are taken as representing all makes of cars. Then we weight the average price of each of the six makes by its proper figure and add the results. The weighted composite prices or aggregates are then resolved into index numbers in the usual manner. There are other instances in which this weighted composite occurs, but they need not be discussed here. It must be understood that in the case of automobiles we have the advantage of knowing with practical accuracy the number of each make of car placed on the market each year.

In Bulletin No. 453, already issued, we have published the list of 550 articles classified by their various groups. We have also published the weights used for each.

Aside from the general and clear-cut presentation of the index numbers by groups and by all commodities, there will be other presentations. For instance, we will show an index of farm products as against nonagricultural products. However, our farm-products group will be farm products just as they come from the farm, and will not include any manufactures. For instance, fluid milk is sold by the farmer and as such is a farm product. However, we have taken the position that if the farmer changes his milk into cheese he is to that extent a cheese manufacturer, and cheese will be listed as a manufactured product.

There will be another index divided into three groups—raw materials, semi-manufactured articles, and finished products. Here again there is an entire reclassification of raw materials, and the group will contain raw materials as we understand the term; that is, raw material as it is produced in its natural state. For instance, it will contain iron ore but it will not contain pig iron. When it comes to what to include in the semi-manufactured group the classification will have to be more or less arbitrary. To a lesser degree this applies to the finished products also.

In the nature of things the sampling method must still control. Even though we were able to increase by fivefold the number of articles which we include, it would still be a sampling method. However, to give you an idea of the size of the sample, the total value of the Bureau's 550 selected articles for 1925 was $45,309,236,000 whereas the total of all goods entering into the market for 1925 was approximately $84,000,000,000. In other words, the Bureau's sample is over 50 per cent of the total value of all commodities of whatsoever nature entering into the markets of the United States. Of course we do not include as commodities either real estate, buildings, stocks and bonds, or a number of other things which will readily suggest themselves to your minds.

If we take the groups, however, our sample is relatively very much larger. The Bureau's farm-products group, on 1925 prices, has a value of $10,339,794,000. This is larger than the value shown by the Department of Agriculture for crops. The reason for this is that the Agricultural Department's figures are for crops only and exclude livestock sold for food, while the Bureau's farm-products group includes such livestock. Our foods group exceeds the census figure for the chief food industries by some $700,000,000; however, this is accounted for largely by the fact that our prices are sale prices while the census figures are production values—practically, cost of production. Our fuel and lighting exceeds the figure given by the Bureau of Mines and the census, but here again the Bureau of Mines quotes f. o. b. mine values of coal, while the Bureau of Labor Statistics figure is the sale value in the primary markets. Resales are eliminated by the Bureau of Labor Statistics as far as possible.

For the 550 articles which we carry, the term "sampling method" hardly applies, because our weights are assumed to be those of the total amounts marketed; and how nearly this proves to be true is shown by the fact that our total for 1925 is $45,309,236,000, whereas the census and other sources of information from which we get our weights show a corresponding total of approximately $46,500,000,000. So you see that so far as the 550 articles we carry are concerned, the sample is almost 100 per cent.

One other point of interest is the percentage that each group bears to the whole. In this connection let me say that the relative importance of commodity groups as measured by wholesale values in exchange for the price-base year 1926 is as follows:

	Per cent
Farm products	21.11
Foods (This does not include articles classed as farm products.)	22.38
Hides and leather products	3.63
Textile products	8.56

Fuel and lighting	16.07
Metals and metal products	13.08
Building materials	5.15
(This does not include such articles as are included in metals and metal products—structural steel, for instance.)	
Chemicals and drugs	1.75
(Here again this does not include such articles as are classed as foods.)	
House-furnishing goods	1.92
(Here again this does not include articles classed as textile or metal products.)	
Miscellaneous	6.35
(The rather high percentage of the total of this group is caused partly by the introduction of automobile tires.)	

To those who desire this percentage distribution in more detail there is attached a table showing such distribution not only by groups but by subdivisions forming the groups.

RELATIVE IMPORTANCE OF COMMODITY GROUPS AS MEASURED BY WHOLESALE VALUES IN EXCHANGE, 1926

Group	Estimated value in exchange	Value expressed as percentage of aggregate value of—	
		Commodities in group	All commodities
1. Farm products	$9,413,212,000	100.00	21.11
a. Grains	1,603,106,000	17.04	3.60
b. Livestock and poultry	3,199,079,000	33.98	7.17
c. Other farm products	4,611,027,000	48.98	10.34
2. Foods	12,627,157,000	100.00	[1]22.38
a. Butter, cheese, and milk	2,389,150,000	18.92	[1]2.51
b. Meats	4,149,125,000	32.86	9.31
c. Other foods	6,088,882,000	48.22	[1]10.56
3. Hides and leather products	1,617,944,000	100.00	3.63
a. Hides and skins	343,845,000	21.25	.77
b. Leather	369,739,000	22.85	.83
c. Boots and shoes	785,328,000	48.54	1.76
d. Other leather products	119,032,000	7.36	.27
4. Textile products	3,817,298,000	100.00	8.56
a. Cotton goods	1,523,849,000	39.92	3.42
b. Silk and rayon	684,210,000	17.92	1.53
c. Woolen and worsted goods	1,105,911,000	28.97	2.48
d. Other textile products	503,328,000	13.19	1.13
5. Fuel and lighting	7,163,607,000	100.00	16.07
a. Anthracite coal	888,141,000	12.40	1.99
b. Bituminous coal	2,157,740,000	30.12	4.84
c. Coke	407,722,000	5.69	.92
d. Manufactured gas	368,717,000	5.15	.83
e. Petroleum products	3,341,287,000	46.64	7.49

Group	Estimated value in exchange	Value expressed as percentage of aggregate value of—	
		Commodities in group	All commodities
6. Metals and metal products	5,832,921,000	100.00	13.08
a. Iron and steel	2,128,331,000	36.49	4.77
b. Nonferrous metals	935,332,000	16.03	2.10
c. Agricultural implements	93,652,000	1.61	.21
d. Automobiles	2,388,248,000	40.94	5.36
e. Other metal products	287,358,000	4.93	.64
7. Building materials	2,836,860,000	100.00	[2]5.15
a. Lumber	1,156,615,000	40.77	2.59
b. Brick	235,154,000	8.29	.53
c. Cement, Portland	260,803,000	9.19	.59
d. Steel, structural	148,868,000	5.25	(3)
e. Paint materials	289,864,000	10.22	.65
f. Other building materials	745,556,000	26.28	[2] .79
8. Chemicals and drugs	862,613,000	100.00	[4]1.75
a. Chemicals	476,782,000	55.28	[4] .89
b. Drugs and pharmaceuticals	117,068,000	13.57	.26
c. Fertilizer materials	145,045,000	16.81	.32
d. Fertilizers, mixed	123,718,000	14.34	.28
9. House-furnishing goods	1,446,819,000	100.00	[5]1.92
a. Furniture	533,202,000	36.85	1.20
b. Furnishings	913,617,000	63.15	[5] .72
10. Miscellaneous	2,829,551,000	100.00	6.35
a. Cattle feed	189,980,000	6.71	.43
b. Paper and pulp	759,383,000	26.84	1.70
c. Rubber, crude	356,630,000	12.61	.80
d. Automobile tires	764,955,000	27.03	1.72
e. Other miscellaneous	758,603,000	26.81	1.70
All commodities	44,582,074,000	....	100.00

[1] Not including articles classed as farm products.
[2] Not including articles classed as metal products.
[3] Included in metals and metal products.
[4] Not including articles classed as foods.
[5] Not including articles classed as textile products or metal products.

It should be noted that the present plan is not only to add to the index new commodities as they appear but to rewrite with each succeeding census; that is to say, the fixed weighting period has been entirely abandoned both in theory and in practice, and the weights will be revised with each census period; the price-base line, however, will be continued until, like 1913, it has outlived its usefulness. It should be further noted that in carrying this index back to 1913 variable weighting factors will be used, to tally as nearly as possible with the quantity entering into the markets of the country in each particular year. For instance, we are not going to carry the automobile weights of 1926 back to 1913, but those weights will be graduated downward to conform to the number of passenger cars actually produced in each census period. This method will be applied to all items as far as possible.

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Chapter V

BANK-NOTE ISSUE

The Position of Paper Currency in the Modern Money Structure.—The importance of paper currency in the money structure has varied widely from period to period and from country to country. In the mediæval period, paper currency had not been developed. Coin was practically the sole medium of exchange in such limited trade as was carried on. Between the mediæval period and the Industrial Revolution, paper currency became firmly established and circulated side-by-side with coin. Bank deposits in the form of checking accounts were in an early stage of development and were subordinate in importance to coin and paper notes. During the nineteenth century, bank deposits developed greatly in relative importance. Two lines of this development may be distinguished. In England and the United States, the line of development led to the handling of about 90 per cent or more of all transactions by checks and deposits without the use of coin or currency as an active medium of exchange. Gold coin was used to a limited extent in retail transactions, but found its primary use as an idle reserve for credit and currency or as a means of settling international balances through bullion shipments. Paper currency was used in retail transactions and as vault cash in the banks. In France and most other continental countries, bank deposits were developed, but in a form which did not dispense to so great an extent with the active exchange of coin and paper currency. Depositors withdrew actual bank notes in settling large as well as small transactions, and so did not rely upon checks as a substitute for coin and notes.

The World War brought about significant additional developments in currency usage. For a time most countries suspended specie payments, withdrew gold coin from circulation, and relied upon paper currency and bank deposits as a medium of exchange. After the War, most countries returned to a gold basis but withheld gold from circulation. Where circulation of gold coin was not prevented by law, it was discontinued by custom and common consent. Consequently, in the modern era, the cash medium of exchange is practically confined to paper currency and subsidiary coin. Gold functions as bank reserve or as bullion for international shipment. In countries such as the United States and England, the dominance of bank deposits and checks is greater than ever. Probably more than nine-tenths of the total volume of purchasing power in such countries consists not of paper notes or coin but of credit in various forms. In the continental countries, substantial progress has been made in the development of the use of checks as a substitute for notes. A relatively larger proportion of transactions than ever before are completed without the use of hand-to-hand currency.

But in spite of the fact that monetary evolution has been strongly in the direction of substituting checks for paper currency, nevertheless paper currency retains a most important position in the monetary structure. In the first place, paper currency has taken the place of gold coin withdrawn from circulation. Since 1913, this process has absorbed more than $3,000,000,000 of new currency. In the second place, the disappearance of gold from circulation has thrown upon paper currency the burden of acting as cash reserve for the whole banking system. In every country, at a given time, a certain ratio of vault cash to deposit liabilities prevails. It may be fixed by law or custom or both. There is some flexibility in the ratio, but when an expansion of bank deposits becomes unusually large, the banks sense the danger of a low proportion of available cash to demand liabilities. Their cash position calls a halt to excessive deposit expansion. Thus currency is a basic conditioning factor in the monetary structure. It sets the limit to bank expansion and calls a halt to overextension of credit.

But suppose, in the third place, that currency itself becomes unusually large. Can it be injected into circulation if bank deposits do not undergo a similar expansion? In countries with highly developed credit systems, the answer is in the negative. As soon as currency exceeds the ratio to demand deposits which custom and convenience dictate, it becomes redundant and flows back to the banks or the Treasury as idle funds. In other words, excess currency is corrected by the limited expansion of bank deposits. Unless deposits expand, additional currency cannot remain in circulation. Currency expansion depends upon antecedent credit expansion. The order of events is first a growth of bank credit and later a demand for hand-to-hand currency. The initiative in an expansion movement lies with bank deposits.

With this introductory explanation of the position of paper currency in the modern credit mechanism in mind, we may proceed to an analysis of the methods by which the modern bank note may be issued and regulated.

The Origin and Nature of Bank Notes.—A modern bank note is a bank's promise to pay bearer on demand a specified sum without interest, transferable without endorsement. Such an instrument may or may not be legal tender, but it is accepted willingly under all normal circumstances in payment of debts. It is a substitute for gold coin as a medium of exchange and therefore economizes the use of that metal. It can be issued in amounts somewhat in excess of the gold supply of the country and yet remain convertible on demand into gold, or it can be issued as pure fiat currency without gold convertibility. It facilitates the transactions of business from day to day and renders indispensable aid in carrying on the productive activities of the world.

In its origin, the bank note is an outgrowth of negotiable bills of exchange or promissory notes and of warehouse receipts for gold by goldsmith bankers. Negotiability of bills had been developed by the Romans, and was thoroughly established, both by custom and by legal decisions, in England and other countries by the sixteenth century. The goldsmith bankers performed the function of receiving gold on deposit for safe-keeping. They gave the depositor a promise to repay an equal amount of gold on demand, as follows:[1]

November 28th, 1684.

I promise to pay unto the Rt. Honble Ye Lord North and Grey or bearer ninety pounds at demand.

For Mr. Francis Child & Myself
Jno. Rogers

Since depositors would not all call at the same time for their gold, and since the deposit was not a specific piece of property set aside but a general claim to funds of the goldsmith, it was discovered that the goldsmiths might extend loans on the basis of their gold holdings. In granting such loans, they gave their promises to pay in a volume somewhat in excess of the actual gold in their possession. This development was, however, rather slow in coming, and was not widespread in England until the latter half of the seventeenth century. The Venice Bank in 1587 received foreign coins and bullion and issued promises to repay, but did not extend such promises beyond the actual volume of specie in its vaults. The Bank of Amsterdam, founded in 1609, was like the Italian banks in issuing merely what amounted to warehouse receipts for coin. The State Bank of Sweden in 1653 is probably the first instance of a bank issuing a true bank note—the bank's promise to pay, not fully covered by specie reserve. The Bank of England, in 1694, acquired the right to issue notes transferable by endorsement, and in 1697, to issue notes to bearer transferable without endorsement. The latter notes are illustrated by the following, dated 1699:[1]

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[1] See Richards, R. D., *Quarterly Journal of Economics*, vol. XLI, p. 380.

27 April
J. V.

I promise to pay to Mr. Daniell Denny or Bearer on demand the Summe of One Hundred and fifty pounds eight shill and 8d ——— London the 24 day of January, 1699.

For the Govr & Compa
of the Bank of England
John (Wase)

This note may be compared in form with the modern national bank note:

The Hastings National Bank will pay to the bearer on demand twenty dollars

Hastings, Michigan
Cashier—————————
(Signature)

November 26, 1910
President—————————
(Signature)

Thus, we may observe that the seventeenth century witnessed the origin of the bank note proper. Indeed, the chief endeavor of banks at this period was to supply a note circulation. As Bagehot points out, "The real introductory function which deposit banks at first perform . . . is the supply of paper currency to the country."[2]

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[1] *Ibid*, p. 399.

[2] *Lombard Street*, 1873, p. 83.

Once the institution as such had been contrived, there ensued numberless experiments in the method, form and quantity of issue. Many of these ended in disaster to banks and note-holders alike, and it was not until about the middle of the nineteenth century that the principles of a safe note issue had been rather clearly worked out. The present chapter attempts to explain the gradual evolution by trial and error of a system of note issue that meets all requirements.

Because note issue preceded book deposits and checking accounts as a system of banking, there was much confusion of thought when the latter development grew up alongside of the former. People are still slow to see the likeness between notes and deposits, and find great difficulty in understanding the place of note issue in a financial system which today depends chiefly upon bank deposits for a medium of exchange. The next section introduces certain fundamental conceptions outlining the relationship of notes to deposits.

The Relationship of Notes to Deposits.—The depositor of a bank may either take out his purchasing power in the form of bank notes or maintain a book deposit on which checks may be drawn. His decision to utilize the deposit in one way or the other is solely a matter of his own convenience. If he wishes to settle large transactions, he will commonly prefer the checking account. If he wishes to make small day-to-day retail purchases, he will commonly prefer notes. The bank is not in a position to dictate which method the customer shall use.

However, whichever method he may decide to use, the bank's liability is the same. Both notes and checking deposits are alike liabilities of the bank to pay money on demand. There is, it is true, a certain obvious difference in the form of the liability, but no difference in the substance.

In spite of this fundamental similarity, there has developed a tendency to give the note-holder some form of special protection. He is often given preferential treatment over the depositor. In part, the theory underlying this preference is that in the ordinary give and take of daily trade, people commonly accept notes without examination of their quality. The ordinary person may have in his possession on the same day notes issued by a score of national banks whose names are totally strange to him. He is the innocent possessor of the notes and requires special protection from the law to insure that he shall not suffer loss from his inability to scrutinize their quality. This theory originated when notes were issued by independent banks. Under the modern tendency to concentrate a monopoly of note issue in the hands of central banks, it does not have much force. If there is only one issuing institution, the note-holder will always know the issuing authority.

An additional theory justifying preferential treatment is that banks face a peculiarly dangerous temptation to overissue notes, a temptation which is not present in creation of book deposits. Such a doctrine had plausibility at a period when the ratio of notes in circulation to book deposits was about 5 to 1. But now, with the ratio reversed, and with demand deposits in the United States more than five times as great as notes in circulation, the doctrine does not have the same significance.[1] It would be impossible to overissue notes in such countries as England and the United States today if the volume of deposit currency were properly restricted. Hence the modern danger in such countries is more in overexpansion of deposits than of notes.

In spite of modern developments, however, the original theories still dominate legislation. It is common to give note-holders a prior lien on the assets of the issuing banks; in many countries, to set up legal reserves for notes while letting the banks themselves determine reserves for deposits; in countries where legal reserves are required behind both notes and deposits, to exact specially heavy reserves for notes; to give note-holders a claim on special property of the bank, such as bonds or commercial paper; and to surround notes with numerous technical requirements calculated to insure their prompt retirement from circulation. Such provisions are built to fit the concepts and conditions of an earlier day, but they certainly do no particular harm under present-day conditions.

However, it is important that we do not allow these discriminations to obscure the fundamental solidarity of notes and deposit liabilities. Note issue is not a law unto itself, a detached segment of banking. It stands or falls with soundness of deposit expansion. It is an integral and functional part of the general banking plan. The unity and interdependence of notes and deposits is a salient characteristic of banking institutions. This emphasis should be borne in mind in the following analysis of the terms and conditions of note issue which have been evolved in some of the leading financial countries.

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[1] For recent statistical data, see Beckhart, B. H., *The Discount Policy of the Federal Reserve System*, 1924, p. 135, footnote.

The Backing for Bank Note Issue.—The various forms of backing for bank note issue may be classified under the following headings:[1]

1. Specie
2. Bonds
3. General assets
4. Specific pledge of commercial paper
5. Land and commodities

1. *Specie.*—A gold certificate bears an inscription of the following type: There has been deposited in the Treasury of the United States of America————dollars in gold. It is in substance a warehouse receipt for gold coin or bullion, and is directly convertible into gold.

By virtue of the fact that the gold is in the custody of the Treasury rather than of the Federal Reserve Banks, it does not appear as part of the reserves of such Banks. For a number of years after 1923, Federal Reserve Banks kept their gold reserves down to a figure which would not be alarming to business by diverting excess gold to the Treasury to be used as backing for gold certificates. If the same gold had been used as 100-per-cent backing for Federal Reserve notes, such notes would have been in effect, though not in name, gold certificates. However, the gold would in that case have swollen the reserves of the Federal Re-

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[1] The stock of paper currency in the United States on July 1, 1926, was as follows:

		Type of Backing
Gold certificates	$1,680,510,609	100 per cent specie
Silver certificates	457,903,515	
Treasury notes of 1890	1,356,304	Partial gold backing
United States notes	346,681,016	
Federal Reserve notes	1,995,205,700	Gold and commercial paper backing
Federal Reserve Bank notes	5,713,148	Bond backing
National Bank notes	702,669,244	
Total	$5,190,039,536	

serve Banks so that their reserve ratio of gold to notes and deposits combined would have been, not in the neighborhood of 70 to 80 per cent, but materially above that ratio.

Ordinarily, dollar-for-dollar gold backing is a wasteful use of specie; but at a time when huge gold imports flood a country with specie, dollar-for-dollar backing serves to absorb the specie without inviting inflation of prices. During and after 1923, Federal Reserve Banks sought to impound the surplus gold dumped in the United States by stowing it away in the Treasury. During the three-year period beginning in 1922, net gold imports of about $800,000,000 were absorbed by a practically equal amount of new gold certificates in circulation, and at the end of the period, in spite of the influx of gold, total central bank reserves were no greater than at the beginning.

The use of gold certificates in this manner is an important factor in the elasticity of our currency system. During and immediately following the War, the urgent demand for currency was met by concentrating the gold in reserves and issuing Federal Reserve notes backed by close to the minimum 40 per cent gold requirement. Accordingly, gold certificates shrank from $1,026,000,000 in 1914 to $171,000,000 in 1922, and gold formerly in the Treasury passed into the Federal Reserve Banks. But by 1926, under conditions of excessive gold supply, gold certificates expanded to $1,076,000,000. The interchange of gold between the Treasury and the Federal Reserve Banks furnishes the power to mobilize reserves and issue Federal Reserve notes during times of gold scarcity, and to hoard reserves and issue gold certificates during times of gold plenty. Elasticity of currency and of reserves is thereby realized, and abrupt disturbances to credit conditions and price levels are averted.

The Bank of England has had a form of note issue which is similar to our gold certificate. The Bank may issue notes up to £19,750,000 backed by government securities; it may issue in excess of this fixed sum, provided the excess is backed pound for pound by gold. In other words, the excess is in substance a gold certificate. Thus, in March, 1926, the Issue Department of the Bank of England reported as follows:

Gold Coin and Bullion	£149,100,000
Notes Issued	168,800,000
Difference	£ 19,700,000

Obviously the gold covered issue on that date was more than seven times as great as the fiduciary issue. Not only is this system needlessly uneconomical in the use of gold, but in time of emergency it lacks prompt elasticity. Faced by a financial crisis and lacking surplus stocks of gold, the Bank may be required to fall back upon a Suspension of the Bank Act in order to tide itself over the acute emergency with additional notes unsecured by gold. This clumsy and disturbing procedure was resorted to in 1847, 1857, 1866 and 1914. Probably the only reason why the system has not given more serious trouble has been the fact that the splendid elasticity of deposit banking, the highly perfected facilities of a discount market, and the enlightened policies of central bank management, have relegated note issue to a very subsidiary position in the financial organization of the country. The Currency and Bank Notes Act of 1928 permits the Bank to increase the uncovered issue over a period of less than 2 years with consent of the Treasury and over longer periods with consent of Parliament.

Before the War, Germany had a system which required 100-per-cent gold backing for notes issued in excess of a fixed sum (550,000,000 marks, with an extra allowance of 200,000,000 marks at periods of peak seasonal demand). The only way by which this requirement could be circumvented was by payment of a 5-per-cent tax on any fiduciary issue in excess of the fixed sum. In the financial reconstruction after the War, Germany dropped the provision for 100-per-cent gold collateral behind emergency note issue.

Thus far, discussion has related to notes secured by 100-per-cent gold cover. We may next consider notes secured by a partial gold reserve. The pre-War German system permitted the Reichsbank, together with a few local banks, to issue a "Kontingent" circulation of 550,000,000 marks backed one-third by gold and two-thirds by bills of exchange. Inasmuch as the maximum issue by this method was low, true elasticity of the currency was unduly restricted. However, the principle of combining a partial gold reserve with a collateral of commercial paper was fundamentally excellent. The National Monetary Commission was impressed favorably by it, and the Aldrich Banking Plan included a scheme of note issue with a backing of one-third gold or other lawful money and two-thirds commercial paper or government securities.

The Federal Reserve Act, as it originally passed the House of Representatives, provided that Federal Reserve notes should be backed by one-third gold or other lawful money and 100-per-cent commercial paper. After changes in the Senate and subsequent amendments, the Federal Reserve note now requires a 40-per-cent gold backing with enough additional commercial paper to give 100-per cent collateral in the aggregate. The influence of the German system of note issue upon the American system is apparent.

When the Dawes Commission mapped out a plan of financial reconstruction for Germany, they proposed a return to the pre-War principle of partial gold reserve combined with commercial paper, with certain adaptations to the unusual conditions of the new era. As finally adopted, the new Reichsbank was authorized to issue reichsmark notes secured by a 40-per-cent reserve, three-fourths of which must be gold at home or abroad and one-fourth of which might be foreign exchange ("Devisen"). The balance of the collateral, *i.e.,* 60 per cent, might consist of commercial paper. The pre-War device of setting a fixed maximum issue for such notes, and requiring mark-for-mark gold backing for excess issue was not revived. The limit imposed by the 40-per-cent reserve requirement was made elastic by permitting temporarily a lower reserve subject to a progressive tax on the reserve deficiency. This elasticity principle is the same as that employed in the terms of issue of the Federal Reserve note. This principle furnishes the opportunity, under wise bank administration, for fully adequate elasticity of note issue for all seasonal and emergency needs.

We may mention in connection with partial gold reserve the special redemption funds or safety funds which are maintained under certain banking systems. However, the problem of note redemption is discussed at some length separately in the present chapter and it is necessary at this point only to refer to the fact that special redemption funds are part of the backing for note issue.

It is also necessary to include here a brief reference to silver backing of paper currency. The silver certificates and United States Treasury Notes of 1890 represent a form of note issue backed by specie other than the standard money. Although at the original time of issue these notes caused serious financial disturbance, nevertheless at the present they simply constitute a fixed mass of currency in our national circulation. Being definitely limited in quantity, they are harmless, and practically as serviceable for currency purposes as a corresponding volume of Federal Reserve notes would be.

2. *Bonds.*—The National bank note is a bond-secured type of issue, modelled after the Bank of England fiduciary note and the notes of the New York Free Banking system and numerous other state banking systems in this country. The British Bank Act of 1844 permitted the issue of notes up to £14,000,000 (£19,500,000 in 1913, £19,750,000 in 1926, £260,000,000 by Amalgamation Act of 1828), against bonds. The New York law as adopted in 1838 and later amended, permitted the organization of independent banks with the privilege of issuing notes backed by stocks, bonds and mortgages. Serious losses occurred at first, but as the system became perfected, the notes were reasonably safe.

The immediate purpose in passing the National Bank Act in 1863 was threefold: (a) to give the country a form of currency that would be uniform in value and in appearance, (b) to give the country a note circulation that would be safe, (c) to furnish a market for Civil War bonds by requiring National banks to purchase national bonds as security for note issue. The last motive was foremost in the minds of the lawmakers, but failed of realization. Less than 4 per cent of the government loans of the War period had been absorbed by the National banks in 1865. The first two motives, uniformity and safety, were almost ideally realized under the Act. The banks were slow at first in coming into the system, but a tax of 10 per cent on state bank notes, adopted in 1865, drove out state issues entirely and persuaded a substantial number of banks to join the new system.

In spite of the many merits of the Act, time developed one very serious fault—inelasticity. This evil was not confined to the note issue feature alone, but we are here interested only in that one aspect of the general evil of inelasticity. Some of the causes of this defect in the national bank note may be stated.

An elastic note issue is one which grows in volume with the general growth of trade, which is capable of quick expansion in financial crisis or other emergency and of prompt retirement after the need has passed, and which is capable of temporary increases and decreases at different seasons of the year. The National bank note was unsatisfactory under all these tests.

One reason lay in the fact that a bank's ability to issue notes at a profit depended upon the price of bonds rather than upon the needs of trade. The principal bonds eligible for backing were 2 per cents, selling at a premium. The maximum note issue could not exceed the par value of the bonds. Hence, the higher the premium, the greater the idle money tied up in the purchase price of the bond. Naturally, whenever a need for more currency existed, the demand for bonds was strong and the price was bid up to a high premium. Thus, as the demand for bonds to secure new notes became urgent, the profit from the transaction tended to disappear and the banks refused to issue notes at a loss.

The premium represented money which was not earning the rate of interest which it might have earned if loaned direct to the public. The loss of interest on account of premium would be greatest when the rate of interest on customer loans was highest. High interest tended to make note issue profitable, if not prohibitive. Now, a time of financial crisis usually is a time of high interest rate, so that at the very crisis when new currency might be needed, the high rates of interest combined with the high bond premium tended to discourage additional note issue.

Hence it came about that notes could be issued to advantage when they were not needed, but could not be so issued when they were urgently needed. They were *perversely elastic.*

Another reason for inelasticity lay in the fact that note issue was limited by the supply of eligible bonds. From 1880 to 1891, the government pursued a policy of paying off the national debt. About one-half of the bonds of the government were paid off, and note issue, lacking eligible backing, shrank from about $344,000,000 to about $168,000,000. This shrinkage occurred at a period when trade was growing rapidly and there was need for a marked increase of currency. Eligible bonds became so scarce that the owner would not sell them but might lend them temporarily to another bank. Issuing banks had to borrow a large part of the bond backing for notes because they could not buy it. The difficulties were so real that, once a note was issued, the bank would keep it outstanding indefinitely even though the need for it had passed. There was no contractibility of issue because the inconvenience of reissue was so great.

Even if price and supply of bonds had been favorable to issue, the delays of issue might permit a crisis to come and go before new cash could be placed in circulation. If the plates and dies were all made up, note issue required at least twenty days; if they had to be made new, forty days. Retirement of notes was as sluggish as original issue. A bank may deposit lawful money in the Treasury and have the Treasury release its bonds to an equal amount. The bank must stand the cost of transportation, of assorting the notes, and of a legal representative in Washington to witness destruction of the notes. Each bank has to keep a redemption fund of 5 per cent of lawful money in the Treasury. Replacement of worn or mutilated notes is at the expense of the bank. If the bank needs to reissue new notes in the near future, the cost of reissue and the difficulty in obtaining bonds will have to be faced. For all these reasons, retirement of notes has been very unsatisfactory. Once the notes are out in circulation the banks prefer to let them stay out, rather than go through the tribulations of retirement and reissue.

In 1907, a financial crisis and panic culminated in the month of October. National bank notes outstanding remained as follows during the autumn months:

1907	NATIONAL BANK NOTES OUTSTANDING
September	$604,056,321
October	603,987,114
November	609,980,466
December	656,218,196

Not until the acute need for cash was a thing of the past did bank notes show any material increase. As in previous panics, the banks resorted to clearing-house loan certificates, a temporary currency collaterated by commercial paper and prime securities. The maximum of such certificates outstanding at any one time during the crisis was $238,000,000. Such certificates were legalized by the Aldrich-Vreeland Act of 1908; and in 1914, under the crisis precipitated by war in Europe, $363,600,000 of them were outstanding at one time. Such an emergency circulation was highly unsatisfactory, yet it was imperative as long as the National bank note dominated our currency system.

The numerous obstructions to elasticity were the more serious because the margin of profit from note issue was at best very small. A sudden increase, even to a moderate degree, in the cost of issue, narrowed the profit margin so seriously that issue quickly became prohibitive. This fact was not, however, ap-

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[1] For a discussion of the seasonal inelasticity of the National bank notes, see the chapters on Federal Reserve Note Issue, pp. 164-167.

parent on the surface. Many people thought the banks made a "double profit,"—2 per cent on the bonds and 6 per cent on the loan of the notes to customers. This superficial view took no account of the expenses of issue, such as loss of interest at 6 per cent on the premium paid for the bond, loss of interest on the 5-per-cent redemption fund, one-half of one per cent tax on the 2-per-cent bonds and 1 per cent tax on the 4-per-cent bonds, sinking fund set aside annually to retire the premium, expense of plates, transportation, etc. When all these items were deducted, the net profit, in excess of the 6 per cent which the bank would earn on a straight deposit loan, was usually not more than 1 to 1.4 per cent. Obviously, any abnormal increase of cost would threaten to wipe out this slender profit margin. The profit margin lacked the capacity to absorb the shocks of market fluctuations, and the notes lacked the capacity to adjust their volume to the vicissitudes of business. The bond secured form of note issue failed to meet the needs of the country.

If the Federal Reserve Act had flatly ordered the banks to retire their notes from circulation, the bonds held as backing would have slumped sharply in selling price. The fact that 2-per-cent bonds had been selling at a premium was due solely to the extraordinary demand created for them by the note issue privilege. With this privilege destroyed, with the bonds consequently depressed to a heavy discount, the banks would suffer a serious loss. It was thought, therefore, that the new law should provide a means of retirement without material loss to the banks.

Accordingly, the law permitted National banks to apply to Federal Reserve Banks to take the bonds off their hands at par and accrued interest. The Federal Reserve Board might require the Reserve Banks to purchase such bonds up to the sum of $25,000,000 per annum. The Reserve Banks might issue Federal Reserve Bank notes up to the par value of such bonds purchased, or they might have the 2-per-cent bonds refunded into new United States 30-year 3-per-cent gold bonds up to half the value, and into United States 1-year 3-per-cent gold notes renewable annually for 30 years up to the other half the value.

Contrary to expectation, the National banks did not apply for sale of their 2 per cent bonds. Largely for advertising reasons, they preferred to keep their notes in circulation. The volume of circulation was actually greater in 1924 than in 1914.

Date	Amount of National Bank Notes in Circulation
July 1, 1914...........	$715,180,000
Dec. 1, 1924...........	737,739,000
March 1, 1927.........	645,369,000

The decline after 1924 was due to retirement of $118,489,900 of 4-per-cent bonds maturing February 1, 1925, about two-thirds of which were on deposit as backing for note issue. This Treasury policy practically forced the extinction of about $70,000,000 of National bank notes. If, as appears likely, this policy is followed with other bonds as they mature, the government may force the retirement of all National bank notes. The elimination of bank notes does not entail a reduction in total volume of currency, since substitute currency is issued in the form of Federal Reserve notes or gold certificates. The composition of the currency is altered, but not its total amount. Moreover, the forced retirement of National bank notes by such Treasury policy does not require the issue of any Federal Reserve Bank notes. The Federal Reserve Bank notes in circulation in 1927 were only about $5,000,000, a negligible amount.[1] Thus, the original plan of voluntary retirement has been practically inoperative because it rested upon the free will action of the National banks; but the new plan of compulsory retirement resting upon the fiscal policy of the Treasury promises to be effective in time.

3. *General Assets.*—The Bank of France in the pre-War era issued notes secured by the general assets of the Bank. This *asset currency* had no specific legal reserve in gold and no specific collateral in the form of bonds or commercial paper. It illustrates the so-called "banking principle" of note issue, in that the conservative wisdom of the Bank itself is the deciding factor in expansion and contraction of notes. Such a system escapes the rigidity of gold certificates and the perverse elasticity of a bond-secured currency. It gives the utmost freedom to the Bank to adjust the currency supply to the changing needs of trade.

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[1] In order to provide silver for export balances, mainly to the Orient, and to retain gold, Congress in 1918 passed the Pittman Act, providing for conversion of up to $350,000,000 of silver coin into bullion, the retirement of a like amount of silver certificates, and the substitution therefore of Federal Reserve Bank notes of similar denominations, backed by short-term United States securities. The amount of silver certificates so retired was about $260,000,000. After the emergency, the Treasury was required to repurchase an equal amount of silver and to retire the Federal Reserve Bank notes from circulation.

Although unusual discretion is vested in the bankers, nevertheless this discretion is circumscribed by certain definite safeguards. Being a prior lien on the general assets of the Bank, the notes really have as security the best commercial paper and the best investments which the Bank holds. No single, specific asset is pledged as particular security against any individual note, but all the heterogeneous assets are pledged *en masse* against all the notes. Fundamentally, under sound bank management, this gives the notes as high a degree of safety as can be obtained under any other system of issue.

Under normal pre-War conditions, the Bank actually kept a specie reserve, gold and silver, averaging about 70 per cent or higher. The law did not require it, but the good judgment of the bankers religiously maintained it. The maximum amount of note issue is fixed by law, but can be raised by the government if occasion requires. As set in 1911, this limit was 6,800,000,000 francs, but it was repeatedly raised during the War in order to permit inflation. The notes were redeemable in gold or silver at the option of the Bank, a provision which made possible the economizing of gold during periods of strain. Notes could be issued only in large denominations, 50 francs or over. This limitation excluded paper notes from use for small transactions, and necessitated an extensive use of metallic currency. In 1914, it is estimated that circulating coin amounted to about 6,500,000,000 francs, as compared with about 6,000,000,000 francs in circulating notes. With all these safeguards, the note issue of France was in normal times thoroughly elastic and safe. The overthrow of these safeguards during the World War is a separate story, related in a later chapter.

The "banking principle" has been rather widely experimented with. The earlier history of the United States furnishes important illustrations. The Suffolk Bank System of New England (1818-1865) provided a central agency of redemption for notes of New England banks. The notes as originally issued were secured by the general assets of the issuing banks. If a banker was inclined to overissue, the necessity of prompt redemption was quickly impressed upon him by the Suffolk Bank. Notes were redeemed on the average about ten times per year, and were therefore kept within reasonable and safe limits.

The New York Safety Fund System, established in 1829, required the maintenance of a central redemption fund to be applied to the debts of insolvent banks, to which each issuing bank must contribute up to 3 per cent of its capital stock. At first this safety fund applied to all liabilities of the banks, but after 1842 it gave note liabilities a prior lien. The notes were an asset currency, and after the preliminary years of trial and error, the system worked with a reasonable degree of effectiveness. The safety fund principle of control of an asset currency was adopted in Canada in 1890. A central fund equal to 5 per cent of note issue is contributed by the issuing banks and placed in the custody of the Minister of Finance, to be used for note redemption in case of bank failure. Notes are issued on the general assets of the banks, but the total volume of issue is restricted to the unimpaired, paid-up capital of the banks. Seasonal elasticity is allowed for by permitting additional issue at crop-moving season up to 15 per cent of capital and surplus, subject to a tax not to exceed 5 per cent per annum. Each bank is required to redeem its notes at its head office and in leading commercial centers. Notes are in minimum denominations of five dollars. The notes pass rapidly from circulation to redemption, and on the average complete the circuit from ten to twelve times each year. One reason for the effectiveness of this redemption mechanism is the concentration of bank management in Canada largely in the hands of eleven banks, with branches all over the Dominion. As long as the redemption process is in force the safety fund is not utilized, since this fund applies only to notes of insolvent banks. The system has a record of excellent safety and elasticity in Canada.

Other illustrations of asset currency are to be found in the State Bank of Indiana (1834-1866), and the First and Second Banks of the United States (1791-1811 and 1816-1836). The successful operation of the banking principle appears to require the following conditions: (a) some degree of concentration in bank management, and the absence of a "free banking system," (b) traditions and standards of conservative banking policy, (c) sufficient actual specie reserve in the banks to provide at all times for redemption of the notes, (d) a special safety fund in custody of a central agency to insure redemption of notes of failed banks, (e) a maximum limit of issue, either by specifying a fixed sum or by restricting notes to a percentage of the bank's capital, (f) a prior lien by the notes on the banks' assets, with double liability of stockholders.

4. *Specific Pledge of Commercial Paper.*—Pre-War bank notes in Germany might be backed by one-third gold and two-thirds commercial paper up to the *Kontingent* maximum of 550,000,000 marks. Note issue above this sum had either to be backed 100 per cent by gold or to pay a tax of 5 per cent per annum. Since the post-War reorganization, notes must be backed 40 per cent by gold and gold exchange and 60 per cent by commercial paper, and any deficit of reserves must pay a progressive tax.

The Aldrich-Vreeland Act of 1908 permitted the issuance of emergency notes by National banks up to 75 per cent of the value of two-name commercial paper having a maturity not to exceed four months. This was official recognition of the principle which had up to that time been successful in Germany. The Aldrich Central Bank Plan proposed a note issue to be backed one-third by gold or lawful money and two-thirds by United States bonds or bankable commercial paper. Both of these American plans were evidence of the favor found in the eyes of American bankers by the German system of commercial paper collateral.

The Federal Reserve note at first called for 100 per cent commercial paper in addition to a gold reserve, but, by virtue of amendment, now calls for not more than 60 per cent of commercial paper collateral and not less than 40 per cent of gold collateral. This note is in part a matter of borrowing from the German system and in part a matter of indigenous evolution of banking experience in the United States. The basic principles underlying the Federal Reserve note are clearly stated in the following summary by the Federal Reserve Bank of New York.[1]

> The Federal Reserve Act in prescribing the security behind Federal Reserve notes introduced a new principle into our currency system. It specifies a security which is sound and at the same time increases and decreases automatically with the business and agricultural needs of the country. This security may be partly gold and partly borrowers' paper, very shortly to be paid. Such paper gives to Federal Reserve notes their distinctive character, and insures their responsiveness to the needs of the country for currency. . . . This paper represents agricultural products or other goods in the process of production or in movement from producer to retailer, in process of export or import, or on the shelves of retailer or wholesaler awaiting sale. The

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[1] *Monthly Review*, April 12, 1922, p. 12.

paper must bear the indorsement of a member bank and its maximum maturity is ninety days, except in the case of agricultural paper which may run for nine months. In actual practice the maturity is shorter, averaging in recent months about fifteen days. . . .

Commercial, industrial and agricultural paper of this type has exceptional advantages as security for note circulation. In the first place, the currency is placed upon an absolutely safe basis. Back of the paper, a large part of which matures every day, are immediately salable goods or other assets which may be realized upon rapidly. Moreover, the reserve of gold maintained against Federal Reserve notes must at all times be equal at least to 40 per cent of the total amount of notes in circulation.

In the second place the currency is immediately related and responsive to the needs of business. When business expands and the movement of goods increases, the amount of paper available as collateral security for Federal Reserve notes is increased. The demand on the banks for currency leads to the presentation of this paper at the Federal Reserve Banks and the issue of notes. Similarly, when the volume of business diminishes, currency is returned to the banks in payment of loans and the banks in turn ship currency to the reserve banks to liquidate borrowings. Thus the *quantity* of Federal Reserve notes is elastic.

In these ways Federal Reserve notes meet two main conditions of a useful currency, soundness and elasticity; and the elasticity is both in the *kind* of security behind them, and in the *quantity* of notes that may be issued.

If there is any flaw in this perfect theory, it lies in the notion of an automatic elasticity such that neither inflation nor deflation can be caused by note issue. Certainly overexpansion of Federal Reserve notes was a contributing cause of inflation in the United States from 1917 to 1920. This aspect of note policy is discussed more fully in separate chapters on the Federal Reserve note.

In general, we may observe that the principle of note issue backed by a specific pledge of collateral paper security is fully adequate to the needs of a modern nation, provided only that general bank administration is in wise and conservative hands. Given reasonably competent management, the plan yields greater elasticity than 100-per-cent bond-secured or gold-secured note issue, and yet just as good safety as either of them. It is just as elastic as the general asset currency of France and probably safer for a country which does not have a central bank.

5. *Land and Commodities.*—In the early years of the eighteenth century, much attention was given to certain currency proposals of John Law. He declared: "Any goods that have the qualities necessary in money, may be made money equal to their value." Land he believed to be such a good, and he was confident that paper money backed by land "will be equal in value to silver, for it will have a value in land pledged equal to the same sum of silver money that it is given out for. . . . This paper money will not fall in value, as silver money has fallen or may fall."[1]

The history of land-secured currencies, illustrating Law's theories, has been quite unfortunate. At the time of the Revolution, the French Assembly issued notes or assignats based upon the confiscated lands of nobles and clergy. From a first issue in 1789 on a moderate scale, the country plunged into reckless overissue, and by 1796 had issued nearly 50,000,000,000 such notes. The notes depreciated to about one-thousandth part of their nominal value. The government endeavored to substitute new land-backed notes, *mandats territoriaux* at the ratio of 1 new note to 30 old, but the new notes were grossly overissued, and resulted in depreciation to about one thirty-thousandth part of the nominal value.

This outcome of events was far different from the glowing hopes entertained by Mirabeau in defending the issue of assignats. Mirabeau declared: "They represent real property, the most secure of all possessions, the land on which we tread. . . . It is thus alone you will pay your debts, pay your troops, advance the revolution. Reabsorbed progressively, in the purchase of the national domains, this paper money can never become redundant, any more than the humidity of the atmosphere can become excessive."

Certain glaring fallacies in the assignat philosophy may be noted: (a) There was no safeguard against overissue, since the value of public lands was no measure whatever of the actual amount of currency needed by the country. (b) There was no provision for redemption in specie on demand; and hence no restriction on notes necessary to keep them at a parity with specie.

The Massachusetts Land Bank of 1740 received capital subscriptions in land or produce, and thereupon issued notes which the subscribers agreed to accept as lawful money in current trade and which they agreed to redeem, after twenty years, in land or produce. The notes quickly lost the confidence of a large part of the public and the Bank was destroyed by the British Parliament in 1741. Similar attempts at note issue secured by land came to grief in the colonies of Connecticut, Rhode Island, and New Hampshire. The "wild-cat" banks of Michigan issued notes in 1837 against mortgages on land as security, but most of these banks failed within a few years and the note-holders lost heavily. Numerous banks in other states went through a similar disastrous experience in the pre-Civil War period.

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[1] See LAW, JOHN, *Money and Trade Considered*, 1750. In criticism of Law's doctrines, see MCLEOD, H. D., *Theory of Credit*, 1897, part II, ch. XV.

With regard to all such experiments, Henry D. McLeod declares, "They have universally failed, and in many cases have been attended with the most dreadful calamities." [1] In spite of this lesson of history, numerous modern proposals to issue notes representing land or commodities continue to appear. When prices of agricultural products fell perceptibly in 1920-1921, there were advocates of note issue backed by farm land, and a bill was introduced in the Senate to make such notes lawful money and to make any discrimination in favor of gold against lawful money a "criminal conspiracy" punishable by imprisonment for not less than ten years. Thomas A. Edison has offered a plan to issue notes secured by staple commodities in warehouse. According to Mr. Edison, "Since the relative value of the earth's produce appears to be constant, a money unit representing basic commodities and nothing else would be equally constant. The true relative value of what we eat and wear goes neither up nor down, or very little." Henry Ford has outlined a scheme to finance the development of Muscle Shoals, Alabama, by issuing notes fully secured by the property itself.[2]

There are certain errors of economic reasoning which seem common to nearly all such proposals. In the first place, it is not realized by the authors of these plans that the value of money is not due to the value of the thing "back" of it, but to the limited quantity of issue relative to the demand for money. In the United States, the value of the physical wealth at present is in excess of $300,000,000,000; yet the total volume of paper currency in circulation is less than $5,000,000,000. The note circulation is less than one-sixtieth of the value of land and other wealth. More than this would contribute directly to inflation. In the second place, it is assumed that the pledging of land or other commodities back of notes is equivalent to the present device of redemption in gold. In the case of gold-backed notes, the unit of redemption is a fixed weight, 25.8 grains of standard gold, a metal nine-tenths fine and absolutely uniform in quality everywhere and at all times. In the case of land-backed notes, the unit of redemption could obviously not be a fixed weight or a fixed area or any other fixed unit because land is not uniform in quality, it cannot be standardized, and a fixed unit of standard land would be meaningless. A true commodity money provides for prompt redemption on demand in a fixed quantity of a standard and uniform commodity.

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[1] *Theory and Practice of Banking*, 1893, p. 244.

[2] For an interesting attack on all such proposals, see Foster, W. T., and Catchings, W., *Money*, 1924, ch. VII.

So far as the writer knows, there has never been an experiment in land-secured note issue under conditions where quantity of issue was properly restricted and redemption of issue in gold or silver was adequately required. It is conceivable that an issue of notes properly safeguarded in this manner might succeed, although it would be a hazardous experiment and one not to be recommended. Such a form of note issue would have not one single merit in preference to the existing forms of note issue in leading countries, and it would have this distinct handicap—in case of bank failure, the land security for the notes would be one of the most nonliquid forms of wealth.

In this form of note issue, a purely temporary expedient is found in the German rentenmark of 1924. Paper marks of the Reichsbank had become all but worthless, and it was necessary to provide an interim currency until permanent financial reconstruction could be planned. A new institution, the Rentenbank, was created and given power to issue a definitely restricted quantity of notes, exchangeable for old paper marks at the rate of one trillion to one. These new rentenmarks were secured by a mortgage on German real estate and certain forms of personal property. They were not legal tender but were acceptable in payment of taxes. They served to furnish revenue to the government and a medium of exchange to industry. However, they were merely a stop-gap until the Dawes Commission could devise a permanent rehabilitation of currency. As a makeshift they are an interesting phenomenon, but no one in authority supposed that such a form of note issue could be of more than emergency significance.

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Chapter VI

BANK-NOTE ISSUE
(Continued)

Redemption of Notes.—From 1791 to 1821, the Bank of England was forbidden by the government to pay out specie; but from 1821 to 1914, with four exceptions, notes were redeemable in gold on demand. The exceptions refer to the suspension of the Bank Act in 1847, 1857, 1866 and 1914, on account of threatened financial crises. Such suspension meant not the stoppage of specie redemption but only the lifting of the fixed limit of fiduciary issue (£14,000,000 in 1844 and £19,500,000 in 1913). During suspension, the extraordinary fiduciary issue was redeemable in gold and the mere knowledge that currency could be had always aided greatly in relieving the panicky state of business feeling. During the World War, Bank of England notes were inconvertible, gold was withdrawn from circulation, and a new legal tender Currency Note (Bradburys) was issued in large volume. When England returned to the gold standard in 1925, she provided that the Bank of England should maintain parity between paper and gold, not by redemption in coin, but by redemption in gold bullion bars of not less than 400 ounces. This redemption of notes in bullion only and to persons presenting more than $8,000 worth at a time served to keep gold coin out of circulation and to keep the machinery of redemption entirely out of the hands of the small note-holder. This very important arrangement was explained as follows by the Committee on the Currency and Bank of England Note Issue:

> The payment of notes in gold coin upon demand is not in itself essential to the maintenance of the gold standard under modern conditions. An obligation upon the bank to buy and sell gold at a fixed price is all that is necessary.

Under the pre-War German system, as amended in 1909, notes were always redeemable in gold coin at the head office, and under ordinary conditions at certain branch offices of the Reichsbank and of four local banks which still practiced the right of note issue. Prior to 1909, redemption had been in any form of "cash." Unusually large demands for gold, while being honored in the pre-War period, were nevertheless likely to be frowned upon and discouraged by indirect influences on the part of the central bank. Specie payments were suspended in 1914 on account of war financing. When Germany returned to gold in 1924, notes of the Reichsbank were not redeemable in gold; but parity between notes and gold was preserved not only indirectly by bank rate and credit policy but by the Reichsbank's standing ready to purchase in foreign exchange markets offerings of bills which were in excess of market demand and to sell bills when market supply fell to an abnormally low point. Thus, the reichsmark was held at fixed parity with a gold monetary unit. As soon as sufficient gold has been accumulated, the Bank is authorized to announce redemption on demand in gold or gold coin or foreign exchange, *i.e.,* claims on gold in certain foreign banks. The redemption of notes in foreign exchange introduces a principle whereby notes can be kept at parity with gold, even though a country has little or no gold at home.

France, before the World War, gave the central bank the option of redeeming notes in either gold or silver. The Bank ordinarily redeemed in gold, but in times of gold stringency, the Bank would redeem in silver unless the note-holder was willing to pay a slight premium for gold. In this manner, the Bank could check any excessive export of gold without abandoning specie redemption. Gold convertibility, abandoned in 1914, was renewed in 1928.

In the United States, according to the Gold Standard Act of 1900, the Treasury is required to keep "all forms of money coined or issued by the United States" at a parity of value with gold.[1] In addition to this all-inclusive provision, there are important special provisions for convertibility of individual kinds of notes. Thus, National bank notes are redeemable in lawful money (gold coin and gold certificates, silver dollars and silver certificates, greenbacks and Treasury notes of 1890) at the United States Treasury and at the bank of issue. A special redemption fund in lawful money amounting to 5 per cent of notes issued must be maintained with the Treasurer of the United States.[2] The

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[1] Although there is no law which specifically makes silver dollars and silver certificates directly redeemable in gold, nevertheless this parity clause would have the effect of making them so if they showed signs of depreciation relative to gold.

[2] Federal Reserve Bank notes are redeemable under the same terms as National bank notes.

Aldrich Plan for a Central Bank System proposed that notes should be redeemed in lawful money. The draft of the Federal Reserve Act as originally passed in the House of Representatives declared that Federal Reserve notes should be redeemed in gold or lawful money on demand both at the Federal Reserve Banks and at the Treasury. This provision was criticised on the ground that the option of redemption in lawful money might be used as a loophole to escape the duty of gold convertibility. Accordingly the final act declared that redemption *might* be in gold or lawful money at the Federal Reserve Banks but *must* be in gold alone at the United States Treasury. In time of gold stringency the option of lawful money redemption enables a Federal Reserve Bank to conserve its gold reserve; but in all ordinary circumstances, any note-holder can obtain gold at a Federal Reserve Bank if he demands it. Each Federal Reserve Bank is required to maintain in the Treasury a gold redemption fund of at least 5 per cent of Federal Reserve notes. Unlike the National bank note redemption fund, this deposit cannot be in any form of lawful money, but must be in actual gold. Although the system of redemption in the United States is highly complicated, nevertheless the note issue of the country is at all times kept at a parity with gold and is directly or indirectly redeemable in gold.

The redemption fund system in vogue in the United States should be recognized as a variation of the Canadian Safety Fund System, the earlier Suffolk Bank System of New England, and the Safety Fund System in New York before the Civil War. These systems are described elsewhere in the present chapter.

Certain general observations on note redemption may be made as follows:

1. Invariable convertibility of all forms of note issue into gold is a characteristic feature of the modern complete gold standard.

2. Convertibility into gold bullion above a fixed minimum sum or into foreign exchange drawn on gold standard countries is of special interest since the World War. Such plans require the withholding of gold coin from circulation but under proper management are entirely adequate to maintain complete parity between notes and gold.

3. Optional convertibility in gold or silver, as in France, or in gold or lawful money as in the United States, allows a certain leeway for economy of gold reserves; but safe operation of such

a plan places very large reliance upon the wisdom of bank administrators.

4. Ease of redemption should be facilitated by making convertibility possible not only at the main office of the central bank but at numerous branches in financial centers. Convenience and absence of cost in the process of redemption should be assured to the note-holder.

Legal Tender and Bank Notes.—In the United States, gold certificates and Treasury notes of 1890 are full legal tender, *i.e.,* public and private creditors are required to accept them in payment of debt; greenbacks are full legal tender except for interest on public debt and for import duties (in practice, since 1879 they have been accepted in payment for duties); National bank notes are not legal tender but are receivable by all national banks and by the government for public dues other than import duties, and may be paid out by the government on accounts other than public debt; Federal Reserve notes are not legal tender, but are receivable by all member banks and by Federal Reserve Banks, and by the government for all public dues; Federal Reserve Bank notes are legal tender of the same kind as National bank notes; silver certificates are not private legal tender but are receivable for all public dues.

Pre-War German mark notes were legal tender and the new reichsmark notes under the law of 1924 are legal tender. Since 1878, notes of the Bank of France have been legal tender. Bank of England notes are legal tender in all payments above £5 and the War-time currency notes are legal tender.

During most of the nineteenth century there was a reluctance to make bank notes legal tender. It was thought that denial of legal tender character would restrict the willingness of people to accept such notes and so would act as a safeguard against overissue and inflation. Gradually this objection was overruled in leading European countries, but it was not overruled when the form of the Federal Reserve note was decided. The fear of inflation from legal tender fiat money caused the lawmakers to deprive the new note of the legal tender quality. However, under all ordinary conditions, these new notes are just as acceptable in debt payment as if they were full legal tender.

Legal tender quality of bank notes is likely to be of unusually great importance under two circumstances. First, if a financial crisis or other emergency threatens, and notes are not legal tender, a desperate struggle ensues among debtors to secure legal means of payment. This has at times resulted in a hoarding of specie, a depletion of bank reserves of cash, and serious financial alarm. If this consideration was important in the past, it is even more so today, because gold in most countries is withheld from actual circulation, and bank notes are the only cash medium available for debt settlement. Second, if specie payments are suspended and inconvertible paper note inflation occurs, as in the United States at the time of the Civil War and in Europe at the time of the World War, the question arises as to whether debts contracted prior to suspension of specie payments can legally be settled in depreciated paper. If the original contracts specified that payment should be made in gold coin of the then prevailing weight and fineness, then gold alone is legal tender in settlement of the contract; but if the contract merely specified the payment of a given number of dollars, then paper notes, however much depreciated, are legal tender.[1]

People have often assumed that the legal tender quality is the factor which gives money its value. That this notion is fallacious is seen by a glance at the depreciated value of overissued greenbacks, assignats, and notes of European countries following 1914. A mandate by the government that a dollar or a mark shall have a certain value, no matter how sweeping or ominous, has never had the power to check inflation, if gross overissue of the notes has been allowed to take place. The legal tender quality may and often does aid in the general acceptability of notes among the people, but it does not decide the value at which they shall be accepted. Indirectly the grant of the legal tender quality to fiat notes may make the public more willing to accept such notes for circulation and so may facilitate the loss of value of the money on account of overissue. Indeed the very fact that legal tender has so often been used as an accomplice of fiat money has been responsible for the unwillingness, already mentioned above, to give bank notes in normal times the legal tender quality at all.

Denominations of Note Issue.—Many English authorities attributed the panic of 1825 largely to overissue of notes. At the time notes of £1 were in wide circulation. In 1829 a law was passed restricting the issue of notes to denominations of not less than £5. This law had the effect not only of forcing gold and silver coin into hand-to-hand circulation, but also of stimulating the development of the system of checks and deposit accounts as a substitute for bank notes. In 1914, faced with a desire to conserve gold and to meet an immediate emergency demand for small money, England authorized the issue of currency notes in £1 and in 10-shilling denominations. Not only did these notes displace from circulation gold coin estimated at about £123,000,000, but also they contributed to inflation by overissue, there being £370,000,000 outstanding in 1920. Since gold coin is withheld from circulation under the gold bullion standard adopted by England in 1925, an indefinite continuance of notes of small denomination is in prospect.

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[1] See the more detailed statement of Supreme Court decisions on these issues on pp. 46-48 above.

In France, before the War, the minimum denomination of note issue was 50 francs, and small change was supplied by gold and silver coin. In Germany, bank notes could not be issued below 20 marks. Since 1914, the gap caused by withdrawal of gold from circulation has been filled in these countries by notes of smaller denomination. The same tendency has appeared throughout Europe. In 1913, about $1,834,000,000 of gold was in circulation in Europe, but during the War, this was concentrated in bank reserves and its place was taken largely by notes of small denominations and by development of checking accounts.

The practice of the United States is indicated by the following table:

TABLE I

KIND OF MONEY	DENOMINATIONS
Greenbacks	$1–$10,000
Silver certificates	1– 1,000
Treasury notes of 1890	1– 1,000
Federal Reserve Bank notes	1– 50
National bank notes	5– 100
Federal Reserve notes	5– 10,000
Gold certificates	10– 10,000

The reason for setting the $5 minimum denomination of Federal Reserve notes has been stated as follows:[1]

> The theory in limiting the notes to large denominations was found in the belief that below an easily reached point paper currency, espe-

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[1] WILLIS, H. P., and STEINER, W. H., *Federal Reserve Banking Practice*, 1926, p. 133.

cially in the United States, tends to remain in circulation and really becomes in fact what is sometimes termed in theory, "a substitute for money." Most authorities on the subject agree that it is not desirable to have bank notes outstanding unless they are regularly presented for redemption at a rate sufficient to bring about their fairly rapid conversion, and hence to afford a competent test of the power of the issuer thus to convert them. In all well-prepared banking laws, effort is made to secure this prompt redemption, and one method looking to that end is the limitation of the notes to reasonably high denominations.

As a result of this view, most of our circulating notes for $1 and $2 are silver certificates; notes for $5 consist largely of Federal Reserve notes and National bank notes; notes for $10 or over consist largely of gold certificates and Federal Reserve notes. The one-dollar bills circulate so much more rapidly than larger notes that about 80 per cent of the cost of printing paper money in the United States is due to the wearing out of the notes of small denomination.

Two very important generalizations may be made with reference to present-day policy in fixing the denomination of notes: (a) the World War has destroyed the objection to substitution of notes for gold coin in circulation. Gold has been economized by withholding it from circulation and paper notes have been a necessary substitute. This change is probably permanent. (b) In countries where deposits are much more important than notes, issue of small sized notes is not dangerous because inflation is fundamentally regulated in such instances by gold and deposits. A disproportionate issue of notes, large or small, will be automatically redundant if other forms of bank credit are held in check. However, in countries where deposit currency is poorly developed, the injudicious issue of notes in small denominations may easily be conducive to inflation. Definite restriction of the amount of issue of the smaller sizes is in such instances important.

Bank Notes as Reserves.—Neither National bank notes, Federal Reserve notes, nor Federal Reserve Bank notes may be counted as legal reserve by Federal Reserve Banks or by member banks. However, there is no clause to interfere with their use as "vault" reserves by member banks, nor are nonmember state banks and trust companies forbidden to use such notes as reserves in compliance with state laws. A considerable volume of such notes is permanently absorbed by the state institutions in this manner. The restriction of the use of notes as legal reserves of member banks was intended to prevent the pyramiding of credits. For instance, if Federal Reserve notes, with 40-per-cent gold backing, could be counted as legal reserve by a member bank which is required to keep a 10-per-cent reserve behind demand deposits, then a dollar of gold would support not only $2.50 of Federal Reserve notes but also $10 of demand deposits of member banks.

An interesting recent development in certain countries has been the counting of foreign currencies as reserves. Thus Germany is permitted to count foreign currencies as reserve up to one-fourth of the 40-per-cent gold and foreign exchange cover for the new reichsmarks. The first statement of the new Reichsbank in October, 1924, listed 204,541,000 reichmarks as "Reserve in foreign currencies." Numerous other countries have found it convenient to adopt a similar policy in an attempt to establish some form of gold exchange standard.

Financial Reports of Reserve Banks.—The position of note issue in the Federal Reserve structure is of such importance that special attention may well be given to the reports of the Federal Reserve Banks. Weekly reports are issued, showing the financial condition of each Federal Reserve Bank and of the twelve Banks combined. As an illustration, the condition reports for July 14, 1926 may be cited. Under the heading of *Resources* and *Liabilities* the following entries appear:

TABLE II

EXTRACT FROM
CONSOLIDATED REPORT OF TWELVE FEDERAL RESERVE BANKS
JULY 14, 1926

Resources		Liabilities	
Gold with Federal Reserve Agents	$1,441,894,000	Federal Reserve Notes in Circulation	$1,707,233,000
Gold Redemption Fund with U. S. Treasury	53,209,000		
Gold Held Exclusively Against Federal Reserve Notes	$1,495,103,000		

The "Gold with Federal Reserve Agents" includes (a) a gold redemption fund maintained at the Treasury in Washington, amounting in practice to about 5 per cent of that portion of the notes against which gold has been pledged as collateral; (b) a reserve fund held by the Agents; and (c) a reserve fund, usually the major part of the total gold reserve for the notes, maintained at the Federal Reserve Board in Washington. The last-mentioned fund facilitates transfers in Washington to and from the redemption fund and the Reserve Banks by book entry only, without actual shipment of gold.

The "Gold Redemption Fund with U. S. Treasury" refers to a 5-per-cent redemption fund maintained by the Reserve Banks directly in Washington rather than via the Agents, and computed only on that part of the note issue not covered by gold collateral. This fund, combined with that in (a) above, constitutes approximately a 5-per-cent redemption fund against the grand total of Federal Reserve notes outstanding.

In addition to the report on resources and liabilities, there is an itemized report of the administration of note issue. The nature of this report is indicated by the following statement as of July 14, 1926:

TABLE III

FEDERAL RESERVE AGENTS' ACCOUNTS,
TWELVE FEDERAL RESERVE BANKS COMBINED

Federal Reserve notes received from Comptroller	$2,859,041,000
Federal Reserve notes held by Federal Reserve Agents	834,921,000
Federal Reserve notes issued to Federal Reserve Banks	2,024,120,000
Federal Reserve notes in circulation	1,707,233,000
Collateral held as security for Federal Reserve notes issued to Federal Reserve Banks	
Gold and gold certificates	304,484,000
Gold redemption fund	98,714,000
Gold fund, Federal Reserve Board	1,038,696,000
Eligible paper	728,899,000
Total collateral	2,170,793,000
Excess collateral, *i.e.*, above notes issued to Federal Reserve banks	146,673,000

The Comptroller of the Currency prepares a surplus of Federal Reserve notes in advance of the probable need for them, and ships the notes to the Federal Reserve Agents. The Agents, being direct representatives of the Federal Reserve Board, hold the notes in readiness to be issued at the call of the Federal Reserve Banks. When issued to the Reserve Banks, the notes are held in their tills until currency demand by member banks brings them into actual circulation. In the above table, the notes received from the Comptroller are more than $800,000,000 in excess of the notes issued to Federal Reserve Banks, and the notes issued but not yet in actual circulation are approximately $300,000,000.

The collateral exceeds the amount of note issue by nearly $150,000,000 at the date mentioned in the above table. This excess collateral reflects a general policy on the part of Federal Reserve Banks to pledge a surplus of commercial paper and gold in advance so that note issue can be expedited when occasion demands increased circulation.

The "reserve ratio" which is commonly quoted is the ratio of total reserve to Federal Reserve note and deposit liabilities combined. On July 14, 1926, this ratio was 74.9 (*i.e.,* total reserves divided by notes issued plus deposits of Reserve Banks). In this form, the reserve ratio shows at a glance the aggregate condition of the Reserve Banks. It does not, however, show the exact condition of note issue separately and alone. To obtain this condition, it is necessary to find the ratio of "gold held exclusively against Federal Reserve notes" to "Notes issued to Federal Reserve Banks," which in this case stands at 73.8. The difference between the combined ratio and the note ratio taken by itself is not in this instance material, but there are times and conditions when the divergence may become wide and significant.

Regulation of the Volume of Bank Note Issue.—The most serious danger in note issue is overexpansion, accompanied by inflation of prices, depreciation of paper in terms of gold, and inconvertibility of notes in specie. It is important, therefore, to consider the problem of controlling the quantity of issue.

1. *The Currency Principle versus the Banking Principle.*—During the early nineteenth century, acute controversy prevailed with respect to two opposed theories of note issue. Lord Overstone, Sir Robert Peel, and others, believed that excessive note issue in the past had caused numerous panics; and they proposed to restrict the volume of notes to an amount equal to the specie circulation which would have existed if no notes whatever had been outstanding. In other words, they would have had notes consist of what would be essentially gold certificates. Then, in case gold were to be drained out of the country by an adverse

balance of payments, the gold certificates would, according to the currency principle, have to be reduced by an equal amount. The resulting scarcity of currency would tend to effect a decline of prices, *i.e.*, a rise in the value of gold at home, and thus would tend to stem the tide of gold export. The Bank Act of 1844 in England was intended to embody the currency principle. The fiduciary issue was set at £14,000,000 because this amount was so small that it could be relied upon to remain in circulation perpetually; but any notes above this sum must be backed 100 per cent by gold. The avowed purpose of the Act was "to cause our mixed circulation of coin and bank notes to expand and contract, as it would have expanded and contracted under similar circumstances had it consisted exclusively of coin." Subsequent experience has shown that the currency principle has no power to prevent panics, and that notes do not automatically contract when gold leaves the country. Nevertheless, the plan eventually proved reasonably workable in England because deposit banking reached such a high perfection of development that note issue was relatively of secondary importance. With the larger mechanism of banking adroitly handled, a few errors in currency theory could not undermine the effectiveness of the whole system.

The advocates of the banking principle held with Ricardo that "The issuers of paper money should regulate their issues solely by the price of bullion, and never by the quantity of their paper in circulation. The quantity can never be too great nor too little while it preserves the same value as the standard." That is to say, overissue is impossible, provided the bank at all times keeps its notes convertible into specie. France and Canada are good illustrations of countries employing the substance of the banking principle; Germany and the United States have with modifications incorporated the principle in their systems of note issue; in short, outside of Great Britain, the banking principle has gradually triumphed over the currency principle.[1]

Yet it must be observed that the banking schools have had to revise their doctrine somewhat. Their notion that convertible notes could never be overissued was refuted during numerous periods of financial boom, and was finally destroyed by the experience of the United States during the World War when convertible Federal Reserve notes were overextended and acted as a powerful contributing cause to the sharp inflation of 1914-1920. The notion that inflation is impossible as long as gold redemption is maintained is a dangerous fallacy. Thanks to the World War, the doctrine is pretty well disposed of. In its place, we have the principle that even a redeemable note issue must be regulated by a conservative judgment of general credit conditions, an alert endeavor to avoid inflation or deflation of prices, and a proper discount rate policy on the part of central banks. With this amendment, the banking principle is well adapted to meet the needs of modern financial systems.

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[1] In 1928, England decided to amalgamate currency notes and Bank of England notes; to set fiduciary issue at £260,000,000; and to permit the Bank to raise or lower this sum by consent of the government.

2. *Limiting Note Issue by Its Security.*—Volume of issue may be restricted (a) by requiring gold backing in whole or in part, (b) by requiring fiduciary backing in the form of bonds, commercial paper, land, or merchandise, (c) by requiring that notes shall not exceed a fixed ratio of the capital or capital and surplus, upon which they have a prior lien.[1] In the previous section of this chapter, numerous illustrations of each type of backing have been given. In general, the modern tendency appears to be a preference for a combination of gold and commercial paper backing, with an emergency provision allowing for a temporary deficit in gold backing but assessing a progressive tax on such a deficit.

3. *Limiting Note Issue by a Fixed Maximum Sum.*—The aggregate note issue may be limited to a fixed maximum sum, as in the case of France, or the fiduciary part of it may be so limited, as in the case of the Bank of England and of pre-War Germany. Where such limits are set, provision for seasonal elasticity may be met by permitting a moderate increase of temporary fiduciary issue at peak seasons of the year, as in Canada and pre-War Germany. To overcome the rigidity of a fixed maximum in time of emergency, it is necessary to provide a means of temporarily waiving the limit. England did this by suspension of the Bank Act, France by raising the maximum, and Germany, before the War, by a flat tax of 5 per cent on excess issue. A better method is a progressive tax on overissue, as in the Federal Reserve note and the new German reichsmark, or tem-

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[1] A summary of note reserve requirements in twenty leading countries is given in the *Federal Reserve Bulletin*, June, 1927, pp. 394–396.

porary increase with Treasury approval, as in the new English system.

4. *Limiting Note Issue by Specie Redemption.*—Bank notes should at all times be redeemable in gold. This redemption may be in gold coin; but since the World War, it has often been in gold bullion or in gold foreign exchange. The problem of redemption has been discussed previously and is mentioned at this point to draw attention to the fact that one of the purposes of redemption is to restrict the volume of currency and to prevent overissue.

5. *Technical Limitations on Note Issue.*—As pointed out earlier in the present chapter, the law may impose a restraint on the issue of notes by limiting the notes to large denominations or by denying them the legal tender quality. Both of these restraints, however, have had to be dispensed with wherever gold has been withdrawn from circulation. In the Federal Reserve Act, a technical clause forbids any Federal Reserve Bank to pay out notes issued through another, under penalty of a tax at the rate of 10 per cent per annum. Moreover, neither Reserve nor member banks can count such notes as legal reserves. The two latter provisions contribute in a limited way to the prompt retirement of notes when the need for them has passed.

6. *Controlling Volume by Restricting Issue to Central Banks.*—Notes may be issued by three possible agencies: government, independent banks, and central bank. Government issue has usually been associated with inconvertible fiat money and violent inflation in time of war. It tends to subordinate true credit policy to fiscal expediency. However, the William Jennings Bryan school of financial theorists was dominated by the dictum that "note issue is a function of government," and forced a compromise in the Federal Reserve Act, whereby Federal Reserve notes are made a direct obligation of the United States government. In actual fact, this concession does not amount to much, because the process of issue is almost completely in the hands of the banks and the notes are true bank notes. Thus, Bryan got the shadow of a government note but Wilson got the substance of a bank note.

Issue by independent banks is generally looked upon as an obsolete arrangement. Canada still makes a success of such a plan, but primarily because banking is highly concentrated in the hands of eleven big institutions, with branches all over the country. The National bank note in the United States is a survival of this method, but the present policy is to displace this note by currency issued through the twelve Federal Reserve Banks. European countries have usually permitted independent banks to continue note issue if they wished. However, most of the banks have gradually surrendered the right, thus giving a near or complete monopoly of issue to the central bank. The central bank is likely to be managed by men with a sense of public responsibility rather than of private profit. Under normal conditions, the central bank tends to build up standards of control of credit and currency and endeavors to avert undue disturbance to prices and other financial elements. It accumulates precedent, tradition, and authority, and is a steadying influence on the banking community at large. The central bank with monopoly of note issue is, therefore, more likely to regulate currency soundly than a mass of scattered private banks.

7. *Limitation of Notes by General Bank Policy.*—More and more in modern countries note issue cannot be abstracted from the general banking policy of the country. Note issue is an adjunct of general banking policy, not the dictator of it. If banks are conservative in their selection of credit risks, if they keep the relation between bank deposits and reserves sound, if they restrain the speculative demands of the community for loans and discounts, note issue will adjust itself effectively to business needs. If the banks do none of these things, then no matter how ingenious the law on currency may be, note issue will fail to serve business needs. Moreover, if the central banks regulate their discount rates, their open-market policy, their reserve ratio, and their other basic functions with a view to the true accommodation of commerce and business, then note issue is not at all likely to be carried to excess. Any surplus of currency will promptly become redundant and will be retired from circulation. The functional interrelationship of note issue and general credit policy is of fundamental importance in any attempt to study the forces regulating a nation's currency.

8. *Types of Elasticity: Secular, Seasonal, Cyclical, Residual.*—In the usual discussion of elasticity of note issue, very little has been said of the importance of secular elasticity—the power to expand at a pace sufficient to meet the growing needs of trade and yet to safeguard the value of money against long-time fluc-

tuations. Would any existing system of note issue have had the power to prevent such prolonged declines of prices as those from 1815 to 1850 or from 1873 to 1896, or to prevent such inclines as those from 1850 to 1873 or from 1896 to 1914? Does modern note issue contain any powers of elasticity adequate to prevent repeated long swings of prices? The answer is in the negative. If a shortage of gold ensues during the next twenty-five years, the notes of the United States as well as those of Europe would be correspondingly restricted because of rigid reserve requirements. There is no recognition anywhere of the possible need for a secular change in reserve ratios. The great historic swings of prices can repeat themselves, and modern note issue has no weapon with which to prevent them. Herein lies a glaring defect in current philosophy on this important subject. Rigid and fixed reserve ratios invite long-time variations in the value of money. The thing which should be rigid and fixed is the purchasing power of money, the standard measuring-rod of values. But this is the very thing which is highly unstable as long as rigid and unvarying specie requirements are enforced.

Cost and delay in both retirement and reissue made the National bank note highly inelastic with reference to seasonal needs. Ease of issue and of retirement and flexible collateral help to make the Federal Reserve note almost ideally elastic from the seasonal standpoint. Canada permits banks during the crop-moving season to issue extra notes up to the amount of 15 per cent of their combined capital and surplus, in addition to the notes outstanding at the opening of the season. Pre-War Germany allowed an extra issue of 200,000,000 marks at the end of the quarters, March, June, September, and December. The freedom of action involved in a pure asset currency insured the franc note of seasonal elasticity; and the Bank of England note did not need much seasonal elasticity, partly because the crop-moving season is a minor event in so highly industrialized a state and partly because deposit currency was so well developed that elasticity was furnished through flexible deposits and checking accounts. By one means and another, the need for seasonal elasticity has been adequately met in the various countries.

Cyclical elasticity requires that at a time of financial crisis or threatened panic, emergency currency should be made promptly available. Abundance of cash allays the fears of the public, halts the runs on the banks, and quells the panicky feeling of the community. The bond-secured National bank note, as previously explained, was of little avail for such a purpose. The Aldrich-Vreeland Act provided for a purely emergency currency, but a permanent solution was not found until the Federal Reserve note was created. (For detailed explanation of the cyclical elasticity of this note, see the chapters following on the Federal Reserve Note.) Suspension of the Bank Act in England, raising of the maximum limit of issue in France, and levying a tax on temporary deficit of gold reserves in Germany and the United States are illustrations of emergency flexibility. These methods of elasticity have proved reasonably successful in adjusting currency to the needs of the countries in times of financial alarm. In 1928 England permitted emergency expansion with consent of the Treasury and France adopted the minimum proportion of 35 per cent gold backing for notes and deposits combined.

Residual elasticity is chiefly a matter of war-time elasticity. Almost without exception, governments in time of major wars are so pressed for extraordinary revenue that they borrow heavily from the banks in the form of both notes and deposits and inflate the financial system. Thus fiscal necessity overrides a sound and stable currency policy. As long as governments are unwilling to balance their budgets out of revenues from taxes and savings, note issue is bound to be made the pawn of military necessity. Sound currency in war time is primarily a question of budgetary policy, and no peace-time restraints will avail anything if governments are determined to spend in excess of their revenues from taxes and savings.

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Chapter VII

THE FEDERAL RESERVE NOTE

THE present chapter and the chapter following present an intensive study of one particular form of currency note which has become of primary importance in the monetary system of the United States, namely, the Federal Reserve note. This study requires an application of some of the general principles of note issue discussed in the two preceding chapters. The Federal Reserve note merits such special consideration not only because it represents the attempt of the framers of the Federal Reserve Act to remedy the evils of inelastic currency as they existed prior to 1914, but also because the principles embodied in the Federal Reserve note have in substantial degree been recognized as models of note control in a growing number of other countries.

Origin and Purpose of the Federal Reserve Note.—Between 1863 and 1913, three great monetary policies were established in the United States. First, by the National Bank Act of 1863 with subsequent amendments, a system of note issue was adopted which abolished the dangers inherent in regulation of note issue by each separate state, and which achieved two indispensable qualities of a sound currency, namely, safety for the note-holder and nation-wide uniformity in the character of the notes. Second, by legislation from 1873 to 1900, the inconvertible paper standard represented by the greenback was eliminated, the bimetallic standard supported by free-silver advocates was rejected, and the gold standard was definitely established. From the Civil War down to the last decade of the nineteenth century, the monetary questions had been chiefly a battle of three standards,—inconvertible paper, bimetallic, and gold. Not until the question of the money standard was out of the way could the country clearly identify a remaining problem of basic importance,—the problem of elasticity of note issue. By the Federal Reserve Act of 1913, elasticity was achieved through the Federal Reserve note. Thus, by successive stages, the United States acquired: first, safety and uniformity of note issue; second, gold as the single money standard; and third, elasticity of note issue accompanied by the banking organization to make elasticity effective.

The panic of 1893 was one of the earliest disturbances to arouse thought on the need for an elastic system of note issue. A series of crises in succeeding years caused continued discussion of the problem, and the acute panic of 1907 finally brought public opinion to a point where legislation was possible. The Federal Reserve note was the outcome of the suffering inflicted upon the country by repeated crises and panics. The conviction became widespread that no escape from such panics could be expected until elasticity of note issue was provided.

A number of attempts at note-issue reform were made before the method contained in the Federal Reserve Act was worked out. In 1894, the American Bankers' Association endorsed the so-called Baltimore Plan, based upon an adaptation of the Canadian system of note issue to conditions in the United States.[1] In 1897, business men from more than 100 cities attended a Monetary Convention called at the initiative of the Indianapolis Board of Trade, and authorized the formation of a Monetary Commission. A year later the final report of this Commission stated:

> By the term "elasticity" as applied to a currency is meant the capacity to expand and contract with an increase or decrease in the demand for it—that is, the adaptation of currency supply to currency need. In the United States, the choice at present is supposed to be between a bond-secured issue and a system in which the notes are secured only by the general assets of the bank. A system of bond-deposit currency will be a rigid system. It cannot respond to sudden needs. It has been fully shown that a bond-secured circulation cannot furnish an elastic medium, expanding and contracting automatically. But it is quite otherwise with a currency which is based upon the general units of the issuing banks. The volume of notes put forth under such circumstances will automatically expand in volume by being issued upon demand from legitimate borrowers, and automatically contract by being returned to the bank when the need for the currency is past.[2]

A bill embodying the recommendations of this Commission was introduced in Congress in 1898, but was not acted upon, partly because political opposition appeared, but chiefly because the Spanish-American War diverted interest for the time being from the question of currency reform. The Gold Standard Act of 1900 reiterated adherence to the gold standard and made provision for the maintenance of all forms of paper currency at a parity with gold, but this Act did not pretend to cope at all with the problem of note elasticity or related banking reform.

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[1] See *Proceedings of the Twentieth Annual Convention of the American Bankers' Association*, pp. 69–77.

[2] *Report of the Indianapolis Monetary Commission, 1898*, pp. 224, 227, 231, 309.

From 1900 to 1910, an able advocate of banking reform, Hon. Charles N. Fowler, Chairman of the Banking and Currency Committee of the House of Representatives, advocated various measures in Congress, calculated to achieve note elasticity and banking reform.[1] Although his efforts were checkmated by the opposition of leading politicians, notably Senator Nelson W. Aldrich, Chairman of the Senate Finance Committee, nevertheless indirectly they bore fruit in the emergency legislation of 1908 known as the Aldrich-Vreeland Act.

This Act merely temporized with a serious situation. The panic of 1907 had finally convinced wide groups of people that some reconstruction of the currency was imperative. On the other hand, the Old Guard in politics were afraid of any meddling with the financial mechanism, and were determined to make only such minimum concessions as might be necessary to appease public opinion. Under the new Act, National banks were permitted, with various limitations, to form "National Currency Associations." These associations were modelled after the city clearing-house associations which had long been in operation. The notes which could be issued through the new associations imitated the Clearing House Loan Certificates which the clearing houses had of their own volition issued during previous panics. The new Act merely legalized what the banks had been doing in times of money stringency. Members of the newly formed currency associations could secure a restricted amount of emergency note issues by depositing state, municipal and railroad bonds, or satisfactory commercial paper. Thus commercial assets as well as bonds were made eligible as backing for notes. Heavy taxation of notes issued was provided, with a view to forcing their retirement the moment that the emergency which caused their issue had been passed.

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[1] A wide variety of plans was advocated during this period by other authorities, among them one of special thoroughness by Maurice L. Muhleman. See the latter's book, *Monetary and Banking Systems.*

The purely temporary character of the Act was emphasized by the fact that it was to expire on June 30, 1914. In the meantime, a National Monetary Commission was created and charged with the duty of recommending a more permanent and fundamental banking law. The term of the Aldrich-Vreeland Act was later extended one year, in order that possible emergencies might be taken care of until the Federal Reserve Act could be made effective. The only notes issued under the Aldrich-Vreeland Act were created and retired between August 4, 1914, and February 12, 1915, during which time the financial strain caused by the outbreak of War in Europe led to the issue and withdrawal of $382,502,645.

The National Monetary Commission, composed of sixteen members of both Houses of Congress, with Senator Aldrich as chairman, proceeded to make an exhaustive study of financial policy in Europe and the United States. Economists and other experts were employed; representatives were sent to Europe to study conditions abroad; several volumes of scientific analysis of the problem were prepared for publication; and a specific plan of reform, which came to be known as the Aldrich Plan, was embodied in a bill for consideration by Congress.[1]

Two basic assumptions, each signifying material progress in monetary discussion, underlay the findings of the Commission:

First, it was assumed that mere emergency legislation was utterly inadequate. The necessity for permanent reconstruction calculated to prevent the acute emergency from arising in the first place was clearly recognized.

Second, it was assumed that note-issue was but part of a larger problem, namely, the reform of the entire banking structure. Reform of note issue alone was seen to be not enough. Note issue was thrown into its proper perspective as an integral part of the general banking mechanism, and a comprehensive plan for the revision of all phases of currency and credit was worked out.

With reference to that part of the broad plan which had specifically to do with note issue, the Commission said:

> It is difficult to imagine how our system of note issue could be

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[1] 62nd Congress, 2nd Session, 1911–1912, *Senate Documents*, vol. VII.

worse. It is upon the bank note issue that we should depend for elasticity in our volume of money. Under any proper system the volume of money increases and decreases in the same way. The history of our bank note issue shows that the needs of business have very little to do with the volume of bank notes. During almost every period of expansion in business for more than thirty years, our volume of bank notes has decreased. During the periods when business was prostrate, as from 1892 to 1897, the volume of our bank notes was largely increased. This is because the volume of our bank notes depends upon the price of government bonds and not upon the needs of business.

To overcome these serious defects, the Commission recommended a currency based upon gold and commercial paper, and constituting a lien upon all the assets of the issuing banks.

When the Democratic party came into power in 1912, it superseded the plan of Senator Aldrich, a Republican, by a plan of its own, eventually to become the Federal Reserve Act. Carter Glass, Chairman of a Sub-Committee of the House of Representatives Banking and Currency Committee, was the individual chiefly responsible for the form finally assumed by the Federal Reserve Act. H. Parker Willis, in his capacity as expert to Chairman Glass, drew up a memorandum summarizing the chief measures which earlier authorities had proposed.[1] This memorandum is of significance as showing the state which public opinion had reached in 1912. The following excerpt is especially to the point:

> Practically all of the plans under consideration agree in providing for issues of notes on a new plan, it being recognized that the existing system of note issue is unsatisfactory. Fundamentally, what is aimed at by all of them is the retirement of bond-secured bank notes of the present type and the substitution of a new kind or class of bank notes. Substantial agreement has been reached with reference to the basis on which the notes that are to supersede National bank issues shall be put out. This should admittedly be the so-called asset currency basis.[2]

This basic conclusion took concrete form and shape in the Federal Reserve note. The source of the idea expressed in the new type of note was in part the deep dissatisfaction with the alternative, or bond-secured, type of note issue; in part the favorable experience of voluntary clearing-house associations with loan certificates issued on an asset currency basis; and in part the observation and study of the favorable experience of certain foreign countries with asset currency.[1]

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[1] The memorandum had reference chiefly to the plans of Maurice L. Muhleman, Charles N. Fowler, and the National Monetary Commission.

[2] See WILLIS, H. PARKER, *The Federal Reserve System*, pp. 131 ff.

The lessons learned from these sources resulted finally in the Federal Reserve note. We may, therefore, turn to an examination of the characteristics of this new form of currency.

Chief Characteristics of Federal Reserve Notes.—1. *Issue by the Government.*—The original draft of the Glass Bill provided for an asset currency *issued by the banks,* and "in all respects similar to existing National bank notes" except that they were not to be backed by bonds.[2] A powerful political faction, headed by William Jennings Bryan, objected to bank notes and demanded government notes, in accord with their favorite maxim that "The issue of money is a function of the government." In order to win the political support of the Bryan faction, President Wilson conceded the point, and the Act was modified so as to make the notes direct obligations of the United States Government. Each Federal Reserve note bears, therefore, the following inscription: "The United States of America will pay to the bearer on demand (specified number) dollars." Unlike the old National bank note, no mention is made on the Federal Reserve note of the member bank which puts the note into circulation. The notes have no advertising value for the member bank. Only the name and number of the Federal Reserve Bank applying for the note issue is contained on the face of the notes. The concession to Bryan was bitterly attacked by bankers, but the Bryanized form of the bill finally stood, in spite of all efforts at amendment and alteration.

In reality, the concession did not materially alter the nature of Federal Reserve notes. Technically, it is true, they are government notes. The government can refuse to issue them at all, or, once issued, can tax them out of existence, and can regulate the profit arising from them by controlling the discount rate. But the government cannot issue the notes directly to the public. Before any notes can be issued, a member bank must request them, and the Federal Reserve Bank of the district must apply to the proper government representative for the issuance of the notes. *The initiative must come from the banks.* Moreover, the government cannot keep the notes in circulation for an excessive length of time, since the means of redemption and retirement are primarily automatic. Such limited power as does rest in the hands of the government has erred on the side of letting the notes be ruled too absolutely by automatic forces and too little by guidance through the Federal Reserve Board. In effect, then, the Federal Reserve note is issued and retired just as it would have been if bearing the specific label of a bank note. The mere technicality of making the notes a government obligation has not perceptibly affected the elasticity of issue. *In practice, the so-called government note is a true bank note.*

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[1] Prior to the National Bank Act, asset currency was common-place in the issues of state institutions. In many instances, the privilege of issue was greatly abused, but it is significant that two of the soundest and best banking plans, the State Bank of Indiana, and the banks of the New England states, operated upon an asset currency principle. Hence, asset currency was not merely an alien idea imported from Europe, but was in a genuine sense indigenous to the United States.

[2] Section 25 of First Draft of the Glass Bill.

2. *Backing For The Notes.*—The backing for Federal Reserve notes is gold and commercial paper. Commercial paper and gold may be combined in any proportions, provided the combined total equals 100 per cent of the note issue and the gold portion equals at least 40 per cent. If gold alone is used as collateral, with no commercial paper, the Federal Reserve note then becomes practically a gold certificate. The Act as originally passed required that the total of gold and commercial paper used as backing must equal 140 per cent of the notes issued. The reduction to 100 per cent was made by an amendment of June 21, 1917. Originally, gold could not be used as sole collateral when notes were issued, but after they were issued, gold could be substituted for the commercial paper collateral, and therefore could be used indirectly to make the notes practically gold certificates. The 1917 amendment permitted the use of gold directly as sole collateral at the time when the notes were issued. This permitted directly what had formerly been accomplished indirectly.

The authority which decides whether gold or commercial paper shall predominate in the collateral offered is not a member bank, but a Federal Reserve Bank. The Federal Reserve Bank makes application to the local Federal Reserve Agent[1] for the notes desired, and this application is accompanied by a tender of such collateral as the Bank, in its discretion, wishes to submit. The Federal Reserve Agent passes upon the eligibility of the collateral, but it is no part of his power to decide whether gold shall be 40 per cent of the collateral or 100 per cent. That decision rests solely with the Federal Reserve Bank. The concentration of this power in the Federal Reserve Banks enables them to make the matter of collateral a question of policy. For example, during and after the World War when gold was plentiful, the Reserve Banks used gold as nearly 100-per-cent backing for notes; whereas, during 1919-1920 at the peak of expansion when gold reserve ratios fell, they used gold as barely 40-per-cent backing, making up the balance, or 60 per cent, by tendering commercial paper collateral.

The forms of paper eligible to be used as backing may be classified as follows:

(a) Notes, drafts, bills of exchange or acceptances, issued or drawn for agricultural, industrial or commercial purposes, and rediscounted by Federal Reserve Banks upon presentation by member banks according to section 13 of the Act. Commercial paper must have at the time of such rediscount a maturity of not more than ninety days; and agricultural paper, of not more than nine months.

(b) Open-market purchases by Federal Reserve Banks, consisting either of bills of exchange indorsed by a member bank, or of bankers' acceptances.

(c) Notes, drafts, or bills of customers of member banks drawn for the purpose of carrying or trading in bonds and notes of the government of the United States, and presented to Federal Reserve Banks for rediscount.

(d) Promissory notes drawn by member banks themselves, to run not exceeding fifteen days, (1) secured by commercial paper eligible for rediscount, (2) or by bonds or notes of the United States, and discounted by Federal Reserve Banks, according to an amendment of September 7, 1916.

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[1] The Federal Reserve Board appoints three out of the nine directors of each Federal Reserve Bank. One of these three representatives of the government is designated Federal Reserve Agent. He acts as Chairman of the Board of Directors and performs numerous special duties.

The first two and the last of these forms of paper—(a), (b) and (d,1)—are intended to furnish the automatic elasticity required of note issue. Such types of commercial paper increase when business increases and decrease when business decreases, and thus furnish a flexible backing calculated to adjust the supply of currency to the needs of industry.

The third and, in part, the fourth of these forms of paper—(c) and (d,2)—have no direct relation to the needs of trade and industry, but are directly related to the needs of Treasury finance. Notes issued against this form of backing have marked similarities to the old bond-secured National bank note. However, such notes came to be of great importance during the period of War financing. The collateral back of them was commonly referred to as "War paper." A large part of government bonds were purchased by private borrowing from the Federal Reserve Banks, and the discounted paper thus acquired by the Banks was eligible as backing for Federal Reserve notes. Fortunately, when War financing was completed, the occasion which called forth large quantities of "War paper" disappeared. Under normal conditions, discounts secured by government bonds and notes are moderate in amount and furnish no basis for unusual inflation of note issue.

To provide for extreme emergencies, the Act permits the Federal Reserve Board to suspend the 40-per-cent gold requirement for a period not exceeding thirty days, and to renew such suspension for periods not exceeding fifteen days. To the extent that notes are issued against deficient gold reserves, they are subject to a graduated tax, beginning at one per cent per annum and rising rapidly as the deficiency of reserves becomes greater. The tax is paid by the Reserve Bank, but the Bank must raise its discount rate to member banks by an amount equal to the tax. These provisions permit expansion in time of unusual emergency, but, through tax and discount rate increases, insure rapid retirement of excess issue as soon as the crisis has passed. Up to the present time, no necessity has arisen for the exercise of these purely emergency powers. This method is an adaptation of the German device of a flat tax of 5 per cent upon excess issue, and is a substitute for the English plan of suspending 100-per-cent gold reserve requirements by Act of Parliament, or the French plan of raising the maximum total amount of note issue if occasion requires.

(3) *Safety.*—The safety of the Federal Reserve note is insured by two chief requirements:

(a) The collateral of 100 commercial paper and gold furnishes at all times liquid assets adequate to protect the notes. Back of the commercial paper, a considerable portion of which matures and is paid within a few weeks of the date of rediscount, are immediately salable products or assets which can be turned into cash quickly. At any time, the Federal Reserve Board may require a Federal Reserve Bank to furnish additional security to protect the Federal Reserve notes issued to it.

(b) The notes, in addition to being direct obligations of the United States, are a first and paramount lien on all the assets of the Federal Reserve Bank through which they are issued. In addition, since the commercial paper used as backing bears the indorsement or signature of a member bank, the notes become a lien upon the assets of the member bank as well. Unless there should be an utter collapse of government as well as of business, the Federal Reserve notes are absolutely safe.

(4) *Redemption.*—Federal Reserve notes are redeemable in gold on demand at the United States Treasury, or in gold or lawful money at any Federal Reserve Bank. It will be noticed that the Federal Reserve Bank has the option to redeem in lawful money, if it desires to conserve gold. This option enables Reserve Banks to concentrate gold in their reserves when necessary,[1] but under ordinary conditions Reserve Banks have not found it necessary to exercise the option. Whenever it is exercised, the

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[1] Such a policy was announced, for instance, by the Chicago Federal Reserve Bank in January, 1919, on account of unusual financial conditions then prevailing.

note-holder who desires gold is obliged to present his notes to the Treasury in Washington.

Each Federal Reserve Bank, and the respective Federal Reserve Agent, maintains a gold redemption fund with the Treasurer of the United States. In the aggregate, this fund is kept at approximately 5 per cent of the notes issued. The gold set aside in this manner counts as part of the minimum 40-per-cent gold backing required of Federal Reserve notes.

The redemption facilities are sufficient to guarantee at all times the parity of notes with gold and the speedy exchange of notes for gold.

(5) *Legal Tender.*—Federal Reserve notes are not legal tender for private debts, but are receivable for all debts to national and member banks and Federal Reserve Banks, and for all taxes, customs and other public dues. By denying the legal tender quality to notes, the framers of the Act thought to discourage inflationary demand for such notes and to prevent them from remaining in circulation after the need for them had passed. By making them receivable by banks and government, and by making them exchangeable for lawful money at any Federal Reserve bank, the legislators sought to pledge that the banks and the government must at all times honor the notes at their full value. The provisions with respect to legal tender have been satisfactory in operation.

(6) *Reserve Qualities.*—Federal Reserve notes cannot be counted as legal reserves by member banks. This limitation was in large part intended as a stimulus to retirement of notes when the need for them had passed. Although this purpose was sound, nevertheless it is partly circumvented by two uses of Federal Reserve notes, neither of which is legally forbidden. One is the use of such notes as reserves by nonmember banks in a great many states; the other is the use of such notes to meet the requirements of till money or vault reserves by member banks. The latter practice is not objectionable, but the former tends to retard the automatic elasticity of the notes by delaying their retirement from circulation. It is doubtful, however, if even the first-named practice of counting notes as reserves of nonmember banks is a force sufficient to interfere seriously with elasticity of note issue. Its influence is not a determining factor among the forces which govern elasticity.

(7) *Retirement.*—Note elasticity involves contraction as well as expansion of circulation. Contraction is more difficult to guarantee than expansion. The following measures were designed to insure the retirement of Federal Reserve notes after the need for them has passed:

(a) The Federal Reserve notes are issued in denominations ranging from $5 to $10,000. Denominations of less than $5 are avoided because smaller units of bank currency tend to persist in circulation longer than is desired. The larger units, being unfitted for the task of making small payments, tend to float back more quickly to the banks, where they can be retired from circulation. Although this arrangement does in fact facilitate redundancy of notes, it has not as a matter of experience proved wholly adequate to insure prompt retirement of notes under unusual conditions, such, for instance, as those of 1919-1920. The arrangement is merely one influence, and often a minor influence, in the direction of note retirement.

(b) As already mentioned, the legal status of the notes is calculated to facilitate their retirement. They are not legal tender in private debts, and are not legal reserves for member banks. Although these provisions contribute toward retirement of notes, they are minor influences in that direction, and by no means decisive or adequate in themselves.

(c) Whenever Federal Reserve notes issued through one Federal Reserve Bank are received by another Federal Reserve Bank, they must be either returned to the original bank of issue, or forwarded to the Treasurer of the United States to be retired. One Federal Reserve Bank cannot pay out notes issued by another, under penalty of a 10-per-cent tax. The effectiveness of this provision is limited by the fact that notes may remain in circulation for a long period without drifting into any of the Federal Reserve Banks.[1] As long as they are in the hands of member banks or of the public, there is no compulsion to present them for withdrawal from further circulation.

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[1] The following table shows the interdistrict movement of notes each year

The foregoing provisions are relied upon to make elasticity purely automatic. They assume that when business declines, the need for currency will likewise decline, and the notes outstanding will therefore become *redundant;* that is, superfluous notes will be deposited by customers with member banks. The latter, being anxious to reduce their accommodation at the Federal Reserve Banks, will naturally send the notes to the Federal Reserve Banks and pay off their loans. In turn, the Federal Reserve Banks will forward the notes to the Federal Reserve Agent or the Treasurer

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from 1916 to 1923, in comparison with total notes retired, total issued, and total outstanding:

Year	Interdistrict Movement (Fit notes returned to bank of issue and unfit notes returned to U. S. Treasury for redemption)	Federal Reserve Notes		
		Issued	Retired	Outstanding (Dec. 31)
1916	$ 40,155,000	$ 208,457,000	$ 122,472,000	$ 300,110,000
1917	92,109,000	1,265,087,000	214,573,000	1,350,624,000
1918	408,607,000	2,095,695,000	586,475,000	2,859,844,000
1919	988,334,000	2,482,515,000	2,046,570,000	3,295,789,000
1920	1,176,154,000	2,215,254,000	1,775,312,000	3,735,731,000
1921	1,212,157,000	2,049,637,000	3,003,577,000	2,781,791,000
1922	777,353,000	1,949,595,000	1,914,195,000	2,817,191,000
1923	792,805,000	1,797,393,000	1,792,257,000	2,822,327,000

The per cent of interdistrict movement to total retirement each year was as follows:

Year	Per Cent
1916	33
1917	43
1918	70
1919	48
1920	66
1921	40
1922	41
1923	44

of the United States for retirement or redemption. This *automatic redundancy* involves, then, three main steps: first, the flow of superfluous notes from customers into member bank deposits; second, the return of such notes to the Federal Reserve Banks in order to liquidate borrowings by the member banks; third, the retirement of the notes by the Federal Reserve Banks themselves.

It was feared, however, that automatic redundancy might not at all times be adequate to secure contraction of note issue. Accordingly, certain measures described below were designed to enable the Federal Reserve Board and the Federal Reserve Banks to bring deliberate pressure to bear in favor of retirement.

(d) The Federal Reserve Board, acting through the Federal Reserve Agent, may reject entirely the commercial paper offered by Federal Reserve Banks as collateral to renew the backing for notes when old commercial paper matures. Likewise, the Federal Reserve Banks may reject entirely the applications of member banks for rediscounts, and thus force them to pay off their borrowings by turning in currency, chiefly in the form of Federal Reserve notes. Although arbitrary power to reject collateral and to refuse rediscounts does exist, the Federal Reserve institutions have preferred not to make use of such powers, but to trust to automatic redundancy.

(e) The Federal Reserve Board has the right to impose an interest rate on notes to the extent that they are backed by nongold collateral, with a view to forcing their retirement. This interest cost, or tax, would fall directly on the Federal Reserve Banks, and would not be shifted to member banks or their customers unless the official rediscount rate was raised. This shifting is unlikely, however, since the rediscount rate will ordinarily be fixed at a proper height. The Federal Reserve Banks would bear the interest charge themselves. This cost would merely reduce their profits by a certain amount, and thereby minimize the surplus earnings due the government as a franchise tax. The government would lose in revenue what the Federal Reserve Banks paid on account of interest on note issue. This power of the Board has thus far remained unused.

(f) The Federal Reserve Banks may, with approval of the Federal Reserve Board, raise the rate of rediscount. The attitude of the Federal Reserve institutions has been that although note contraction is one criterion in fixing the discount rate, it is a subordinate one, and the rate should be fixed primarily with a view to accommodating the general needs of credit and business. The Board has taken the position that, since note elasticity is automatic, there is no need to meddle with it by manipulating the discount rate. Thus, the Federal Reserve Bulletin of August 1919, says: "There cannot at any time be more Federal Reserve notes in circulation than the needs of the country at the present level of prices require, and as the need abates the volume of notes outstanding will be correspondingly reduced through redemption." In taking this stand, the Federal Reserve authorities practically deny any responsibility for inflation due to overissue of notes. Whatever happens, they exonerate themselves on the ground that note-issue automatically regulates itself and therefore is beyond their power to add or detract. The attitude overdoes a blind faith in automatic elasticity. As will be explained later, inflation is entirely possible even with the Federal Reserve note, unless discount policy and related policies are used as timely checks upon undue expansion. The automatic forces of contraction and retirement are not at all times sufficient, but require to be supplemented by a discount and open-market policy deliberately calculated to bring pressure to bear for note retirement.

The Elastic Element under Changed Conditions.—The elasticity which the framers of the Federal Reserve Act had in mind was quite different from the elasticity which has actually developed. They believed in the simplest kind of flexibility, with the Federal Reserve note rising and falling in accord with the needs of trade, and with other forms of currency virtually constant in volume. If these conditions were to prevail, the fluctuations of one distinct type of currency, the Federal Reserve note, would measure with close precision the elasticity of note issue.

In actual practice, however, the elastic element has been more complex than these original assumptions. The complexity arises from the peculiar relationship existing between a member bank and a Federal Reserve Bank. The member bank draws a check on its credits at the proper Federal Reserve Bank, demanding payment in currency. Any kind of currency will do, so far as the member bank is concerned. It makes no difference to the member bank whether the currency received is gold certificates, National bank notes, or Federal Reserve notes. Even if it did make a difference, the member bank has no power to compel the Reserve Bank to give Federal Reserve notes in preference to other forms of currency. The particular kind of currency which shall be paid out into circulation is a question to be decided by the Federal Reserve Bank alone. If the Reserve Bank wishes, it may meet a member bank's demand for currency by putting any form of its cash reserves into circulation. For instance, the Reserve Bank may have greenbacks on hand as cash reserves, and when currency demand is felt, may pay these out into circulation. Note circulation would then have expanded without any change in Federal Reserve notes. Or the Reserve Bank may pay out gold or gold certificates instead of issuing new Federal Reserve notes. Under these conditions, changes in the total, rather than in single forms of money in circulation, indicate the expansion and contraction of the currency. The elastic element is not the Federal Reserve note by itself, but all forms of money in circulation combined. Whether there is a little more of Federal Reserve notes and a little less of gold certificates is a question affecting only the proportions between the component parts of the circulation, not the total amount of circulation. A little more of this, a little less of that, form of currency affects merely the composition of the currency. The elastic element is the total circulation, not the individual circulation of the Federal Reserve notes alone.

Some Factors in Elasticity since 1914.—During the period of the World War, the Federal Reserve institutions pursued a policy of concentrating gold in the reserves of the Federal Reserve Banks. This involved both withdrawing gold from circulation as much as possible and impounding new gold derived by importation. The purpose of concentrating gold in central reserves was to prepare the country for the financial strain of the War.

As a means toward this end, Federal Reserve notes were put into circulation as a substitute for gold in circulation. The gold was drawn into the Reserve Banks, and for a time was used as almost 100-per-cent backing for Federal Reserve notes issued. When the United States entered the War in 1917, there were $420,000,000 of notes in circulation, and the gold cover was about $400,000,000. The gold formerly in circulation had been "mobilized." Note issue had expanded, not because of the needs of trade, but because of a deliberate policy to substitute notes for gold. Note expansion was not in any sense of the word a manifestation of that automatic elasticity intended by the framers of the Federal Reserve Act. It was a form of wilful elasticity, brought about with definite intent, not in response to the needs of trade but in response to the Federal Reserve view of what would be desirable in preparing for the financial strain if the United States should enter the War.

It was considered essential to mobilize not only old gold formerly in circulation, but also new gold secured by import. Between 1915 and the end of 1918, the net excess of gold imports over exports amounted approximately to $1,152,000,000. As rapidly as possible, this huge stock of new gold was concentrated in reserves where it afforded a basis for expansion both of note issue and of bank credit. Note issue was not an automatic response to the changing needs of trade so much as a deliberate attempt to absorb the enormous imports of gold.

During the period of War financing, note issue was complicated by many factors besides gold policy. A remarkable expansion of Federal Reserve notes set in. At the end of 1917, note issue amounted to $1,246,488,000; at the end of 1918, $2,568,000,000; at the end of 1919, to $3,000,000,000; and at the end of 1920, to $3,400,000,000. The collateral chiefly used to support this great expansion was "War paper" and "commercial paper." War paper consisted of member bank borrowings from Federal Reserve Banks, secured by United States bonds or certificates. Member banks helped finance the War by discounting their own notes, secured by Liberty Bonds or Treasury certificates, with the Federal Reserve Banks. With the funds thus secured, member banks both bought Liberty Bonds and loaned to their customers so that they too might buy Liberty Bonds. The motto became, "Borrow and buy," *i.e.*, borrow from the Federal Reserve, and buy the bonds to finance the War. The measure of such borrowings is indicated by the Federal Reserve discounts secured by

United States obligations. At the end of 1919, such discounts amounted to about $1,700,000,000, or 80 per cent of all Federal Reserve discounts. War paper was four times as important as commercial paper in furnishing Federal Reserve discounts.

The War paper thus created was eligible to be used as backing for Federal Reserve notes. At the end of 1919, the note issue stood as follows:

Federal Reserve notes in circulation	$3,057,600,000
Gold cover	1,240,032,000
Paper collateral, required	2,052,066,000
Paper collateral, actual,	
War Paper	1,700,000,000
Commercial Paper	1,011,000,000

It is obvious that notes were backed in very large measure by War paper during this period. Commercial paper was of secondary importance. The notion of automatic elasticity to meet the needs of trade became quite meaningless. The elasticity which presented itself was dictated by fiscal policy and War financing. Note expansion was not necessary to meet the needs of trade, but became simply a part of the general credit inflation which was taking place.

During 1920, note issue continued large, and reached its peak at $3,400,000,000 in December of that year. This note expansion was collateralled by commercial paper to a greater extent than that in any earlier period. The last War loan had occurred in May, 1919, with the Victory Loan. After the end of 1919, War paper shrank in importance, but commercial paper rapidly expanded. Beginning in 1919 and culminating in 1920, there developed a great cyclical wave of business prosperity and speculative boom. Price inflation and credit expansion reached extreme lengths. To meet the demands of their customers, member banks rediscounted commercial paper at Reserve Banks. Such commercial paper was eligible as backing for note issue. It furnished a basis for an extreme expansion of Federal Reserve notes. The gold backing fell close to the 40-per-cent minimum requirement. Gold reserves were weakened by heavy exports of specie during this period. During 1919 and the first three months of 1920, the net excess of gold exports over imports was $396,000,000. Under these conditions, notes came nearest to the original idea of an asset currency, with a minimum gold cover of 40 per cent.

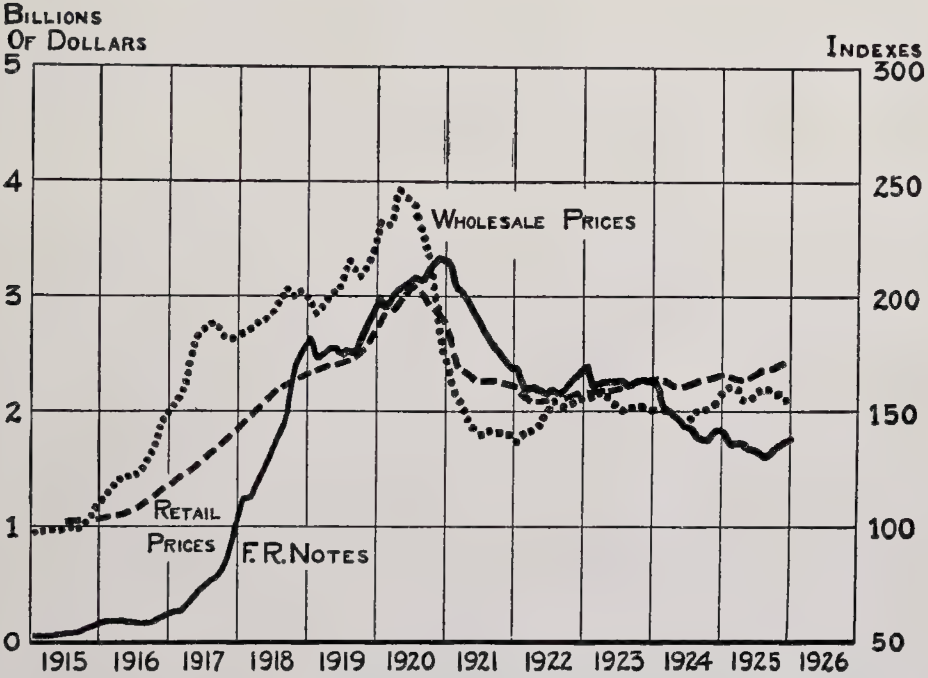
From the standpoint of elasticity, the record did not bear out the expectation of the original framers of the Federal Reserve Act. The expansion was excessive and highly inflationary, as indicated by the accompanying chart. Automatic forces of elasticity showed no power to resist the forces of inflation.

Two great transitions occurred in 1920: that from business prosperity to depression, and that from gold exports to gold imports. The heavy gold imports, coming at a time of business liquidation and contraction, were used to pay off member bank indebtedness to Reserve Banks. As such indebtedness fell, Federal Reserve notes were retired rapidly from circulation. From September, 1920, to August, 1922, the net excess of gold imports over exports was $1,028,136,000. Federal Reserve rediscounts of bills fell from $2,827,000,000 to $400,000,000 and Federal Reserve notes, from $3,400,000,000 to $2,100,000,000. Gold was absorbed by the Federal Reserve Banks and substituted for commercial paper as cover for note issue. Notes became in large measure practically gold certificates. At the end of 1922, more

CHART NO 1

PRICES AND NOTES

1913 = 100



than $2,100,000,000 of gold was held as cover for Federal Reserve notes. Notes ceased to be a pure commercial asset currency and became a gold-backed currency.

By 1922, business liquidation had ended. Business expansion became widespread. Meantime, gold imports continued in heavy volume. The net excess of gold imports over exports from September, 1922, to November, 1924, was $587,984,000. The relation of such imports to currency policy during business expansion was quite different from the relation during business liquidation. The new gold was placed on deposit at Federal Reserve Banks. There it could be counted as legal reserves by member banks. When this was done, the member banks were able to increase their loans to customers, without adding to their rediscounts at the Federal Reserve Bank. That is, instead of increasing lending power by increasing their indebtedness at Reserve Banks, they did so by placing imported gold on deposit with the Reserve Banks.

If member banks wished actual currency instead of higher legal reserves, they drew checks on their gold credits at the Reserve Banks, and cashed the checks in currency. Member banks were thus enabled to increase their supply of currency without having to borrow from the Reserve Banks. The Federal Reserve Banks adopted the policy of meeting this currency demand not by the issue of Federal Reserve notes, but by paying gold or gold certificates out into circulation. The shift in relative importance of Federal Reserve notes and gold certificates is shown by the following comparison:

PER CENT OF TOTAL MONEY IN CIRCULATION REPRESENTED BY:

Date	Federal Reserve Notes	Gold and Gold Certificates
Aug. 1, 1922	48.8	13.5
Dec. 31, 1924	36.9	28.5
Nov. 1, 1925	34.8	30.5

Certain important conclusions follow from this development. First, the policy of paying gold out into circulation reduces the showing of gold reserves by the Federal Reserve Banks. The gold is held by the Treasury, and does not appear in the weekly reports of Reserve Banks as part of their gold reserves. Second, it makes elasticity a question of the total circulation rather than of the circulation of Federal Reserve notes alone. Federal Reserve Banks continue to be the source of additional currency, but Federal Reserve notes cease to be the form which additional currency takes. Third, under these conditions, currency elasticity ceases to be reflected in an asset currency responding automatically to the needs of trade. Rather, it is reflected in a nonasset currency, gold certificates, responding to the Federal Reserve Bank conception of sound gold policy. Gold policy supersedes automatic elasticity as the determining factor in currency issue.

Since December, 1924, periods of heavy gold exports have alternated with periods of heavy gold imports. The principles governing currency policy have been similar to those formulated during the decade preceding. When gold imports are in excess, currency demand may be met by paying gold out into circulation. When gold exports are in excess, currency demand may be met by Federal Reserve notes.. Currency policy has become coördinated with gold movements, and note issue has been managed and controlled by Federal Reserve institutions with a view to preventing the disturbance of sound financial conditions.

The numerous phases of currency elasticity under the Federal Reserve system may be summarized as follows:

1. 1915-1917. Gold withdrawn from circulation, concentrated in reserves, and Federal Reserve notes, backed by nearly 100-per-cent gold cover, put into circulation. Gold imports likewise concentrated in reserves. Elasticity a tool of gold policy.

2. 1917-1919. Enormous expansion of Federal Reserve notes, backed mainly by "War paper," and contributing to the inflation of the period. Elasticity closely related to War financing.

3. 1919-1920. Gold exports during period of business boom. Note expansion reached peak. Collateralled largely by commercial paper as well as by War paper. Asset principle of automatic elasticity unable to resist the tide of inflation.

4. 1920-1922. Gold imports arriving during business liquidation. Reduction of member bank indebtedness, and use of gold as main cover of notes issued. Federal Reserve notes showed great power of contraction, but largely subservient to gold policy.

5. 1922-1924. Gold imports arriving during business expansion. Gold paid out into circulation, and substituted for Federal Reserve notes. Asset currency displaced by gold currency. Elasticity a matter

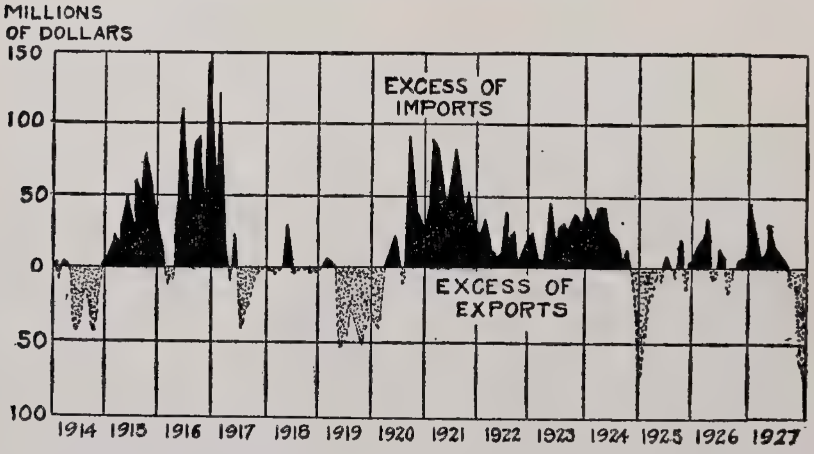
of total circulation rather than of Federal Reserve note circulation alone.

6. 1924-1928. Alternately a net excess of gold exports or of gold imports. Gold paid out into circulation when in excess. Federal Reserve notes issued to meet currency demand when gold is scarce. Elasticity of combined gold circulation and Federal Reserve notes controlled with a view to preventing disturbance of stable financial conditions.

Gold Shipments and Currency Policy.—Throughout the history of the Federal Reserve system, gold supply has had a very important bearing upon note issue. In vital respects, currency policy has been subordinated to gold policy. The accompanying chart showing the monthly net excess of gold imports or exports since 1915 helps to visualize the gold movements of an extraordinary period.

CHART NO 2

UNITED STATES
GOLD SHIPMENTS



At almost no part of this period could the gold situation be said to have been normal. Heavy gold imports have alternated with heavy exports.[1] It would be substantially true to say that

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[1] 1915–1918, Net excess of gold imports	$1,152,000,000
1919–Mar. 1920, Net excess of gold exports	396,000,000
Sept. 1920–Aug. 1922, Net excess of gold imports	1,028,136,000
Sept. 1922–Nov. 1924, " " " " "	587,984,000
Dec. 1924–Dec. 1925, " " " " exports	165,210,000
1915–1925, Net excess of gold imports	$2,206,910,000

the Federal Reserve note has never had a chance to operate under normal gold conditions. It has been deprived of this chance by the unusual War and post-War gold movements.

In the midst of these great abnormalities, the currency policy of the Federal Reserve institutions has shown wide capacity for adaptability to changing conditions. Early in the period, note issue was adapted to the task of withdrawing gold from circulation, and of concentrated gold imports in reserves. In 1919 and the early months of 1920, note expansion contributed to inflation, in spite of the fact that gold was being exported in large amounts. In 1921 and the first half of 1922, note contraction in a drastic form was accomplished, notwithstanding the fact that gold was being imported in large amounts. From 1922 to 1924, currency requirements were largely met by gold certificates because Federal Reserve institutions believed it to be the best method of absorbing continued heavy gold imports, yet at the same time preventing price inflation. In all of these periods, there was a mixture of the ideal or so-called automatic elasticity contemplated by framers of the Federal Reserve Act, and of a managed elasticity, subservient to changing gold conditions and to the numerous policies deliberately entered into by Federal Reserve authorities. The experience of the period, in so far as relations between gold supply and currency issue are concerned, demonstrates the wide flexibility of policy which is permitted under the Federal Reserve system. Certainly the system contains a high capacity to adjust currency issue to extreme and extraordinary circumstances.

The gold conditions of the future, although unpredictable, nevertheless may roughly be expected to approach more nearly the pre-War, or so-called normal, distribution of gold between nations. Under such anticipated conditions, what forms of flexibility should be expected of the Federal Reserve note? To answer this broad question, it is necessary to examine the main types of currency elasticity which are required under normal conditions. These types are discussed in the following chapter under the headings,—seasonal, secular, and cyclical elasticity.

Chapter VIII

THE FEDERAL RESERVE NOTE
(Continued)

THUS far, we have discussed currency elasticity without distinguishing the different types of fluctuations which may occur. These types may be classified under the headings,—seasonal, secular, cyclical, and irregular. (Definition of these terms has already been given in Chapter IV. See pages 74-75.) The last, or irregular, form of fluctuation is best illustrated by the period of the World War. Since the preceding chapter has dealt at some length with the elasticity of currency during the War period, we may now devote attention chiefly to the other three types of fluctuation,—seasonal, secular and cyclical.

Seasonal Elasticity.—After an exhaustive statistical study of the seasonal demand for currency over the period 1890-1908, E. W. Kemmerer reached the following general conclusion: [1]

> The National bank note circulation does not appear to exhibit any considerable seasonal elasticity, *i. e.,* rise and fall according to the seasonal variations in the demands of trade. It is noteworthy, however, that the increase in the circulation which takes place normally from year to year, takes place largely in the fall and early winter when it is most needed. Apparently, banks intending to increase their circulation postpone doing so until the crop-moving season approaches. There is no evidence of contraction when the crop-moving demands are over, the National bank note elasticity being (to use a rather inelegant expression) of the chewing gum variety.

This seasonal inelasticity of currency resulted in numerous disturbances. The call loan rate averaged around 3 per cent during dull months, but reached about 7 per cent in active months of the typical year. Interest rates on 60-90 day two-name commercial paper lacked stability and ranged between 2 per cent and 6 per cent in normal years. Every fall, during the harvest season, clearing-house banks of New York City shipped about $50,000,000 of lawful money to banks of the West. Although this drained the New York market, it did not adequately satisfy the interior

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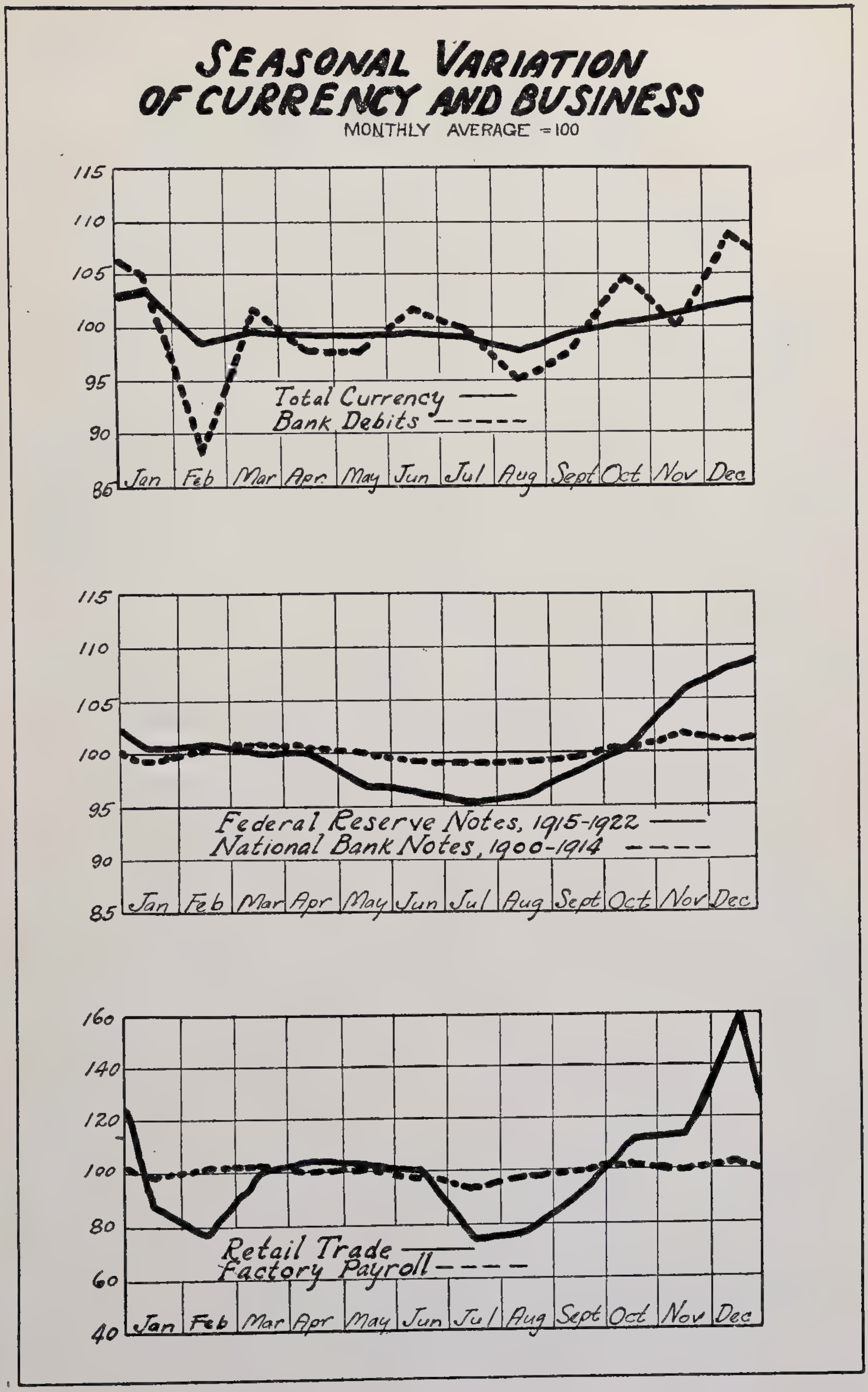
[1] *Seasonal Variations in the Relative Demand for Money and Capital,* p. 229.

CHART NO 3


SEASONAL VARIATION
OF CURRENCY AND BUSINESS
MONTHLY AVERAGE = 100
115
110
105
100
95
90
85
Total Currency
Bank Debits
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sept
Oct
Nov
Dec
115
110
105
100
95
90
85
Federal Reserve Notes, 1915-1922
National Bank Notes, 1900-1914
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sept
Oct
Nov
Dec
160
140
120
100
80
60
40
Retail Trade
Factory Payroll
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sept
Oct
Nov
Dec

market. The slowness with which money was transferred from section to section caused sharp fluctuations in the price of domestic exchange between such points as Chicago and New York, or St. Louis and New York. When the West needed money, a heavy premium on domestic exchange tended to take effect, and interest rates tended to be bid up very high. On the average, the total money in circulation during autumnal months was only about $70,000,000 more than the amount in circulation during the dull summer months, whereas a difference of at least two to three times that amount would have been necessary in order to satisfy adequately the needs of business.

The Federal Reserve system in general, and the Federal Reserve note in particular, have solved the main difficulties of the seasonal problem. The accompanying charts make several comparisons which show the relation of note circulation to other financial factors.

The top chart compares total currency in circulation with bank debits as a measure of general business. Both factors decline in early spring, show firmness in later spring months, fall to a low point in July and August, rise in autumn months to meet the needs of farm harvest and manufacturing activity, and reach the highest point of the year around the holiday season. The general correspondence between the two curves is evident. The use of total currency instead of Federal Reserve notes alone is adopted because, at certain periods, the placing of large amounts of gold in circulation means that the seasonal demands for currency are often met by gold certificates rather than by Federal Reserve notes. As long as abnormal gold circulation remains an important factor, total currency has to be used if we are to have a complete measure of seasonal variations. Total currency needs to be about $300,000,000 greater at the highest period of the year than at the lowest.

The middle chart compares seasonal fluctuations of National bank notes before 1914 with those of Federal Reserve notes from 1915 to 1922. Later years are not included in Federal Reserve note indexes because they are distorted by the policy of paying gold out into circulation rather than of issuing notes. The fixity of the National bank note contrasts sharply with the flexibility of the Federal Reserve note. The seasonal difference between

Federal Reserve notes at highest and lowest months is between $200,000,000 and $300,000,000.

The bottom chart presents seasonal fluctuations of department store sales and of factory payroll. These items are selected because they reflect sensitively the seasonal changes in business needs for currency. They require the use of cash as well as of checks and deposit accounts. Although they do not show the same degree of fluctuation, nevertheless they do show fundamentally the same direction of trend, with summer low and autumn high.

The Federal Reserve note shows a capacity to contract, as well as to expand, in response to seasonal needs. The chief contraction occurs during about a four-week period immediately following the peak holiday season in December. As soon as the holiday rush is past, from $200,000,000 to $300,000,000 of notes in circulation become redundant. They are returned to the Federal Reserve Banks and retired from circulation. This contraction during January each year is shown by the following table:

TABLE I

Year	Contraction Of Notes In Circulation
Dec. 1919–Jan. 1920	$213,000,000
Dec. 1920–Jan. 1921	290,000,000
Dec. 1921–Jan. 1922	218,000,000
Dec. 1922–Jan. 1923	243,000,000
Dec. 1923–Jan. 1924	291,000,000
Dec. 1924–Jan. 1925	257,000,000
Dec. 1925–Jan. 1926	228,000,000
Dec. 1926–Jan. 1927	237,000,000

It is in respect to seasonal elasticity that the Federal Reserve note measures up most perfectly to the standard of "automatic redundancy." As will be seen in later paragraphs, this quality is not so perfectly attained in either cyclical, secular or irregular elasticity. Seasonal elasticity is the only type of fluctuation in which the Federal Reserve asset currency accomplishes the ideal of a currency rising and falling automatically to meet the needs of trade. When we deal with fluctuations other than seasonal, we find that the ideal of automatic, self-regulating expansion and contraction is not realized.

The Long-Time Trend.—If the United States had possessed the Federal Reserve system of note issue from 1896 to 1914, there probably would have been the same steady increase in prices as occurred under the old National bank note. This inference is, of course, based upon hypothetical assumptions, but there are good reasons for making the inference. During this period, there was an unusually heavy production of gold, and the oversupply of gold was a most important factor in the long-time price increase of about 50 per cent. Since the Federal Reserve note is tied up with a gold reserve, we must infer that in the event of a persistent and permanent increase in the gold supply over a long period, there tends to ensue a corresponding increase in Federal Reserve note issue. Consequently, we have no basis for looking to the Federal Reserve note as a means of protecting the country from great up and down swings of the price level over a long stretch of time. The secular trend of note issue must be expected to correspond fundamentally with the secular trend of gold supply.

It is generally conceded to be desirable that long-time swings of the price level should be reduced to very moderate bounds. Stability of the price level is the objective of sound financial policy, but such long-time stability of the price level is not assured by the Federal Reserve note.

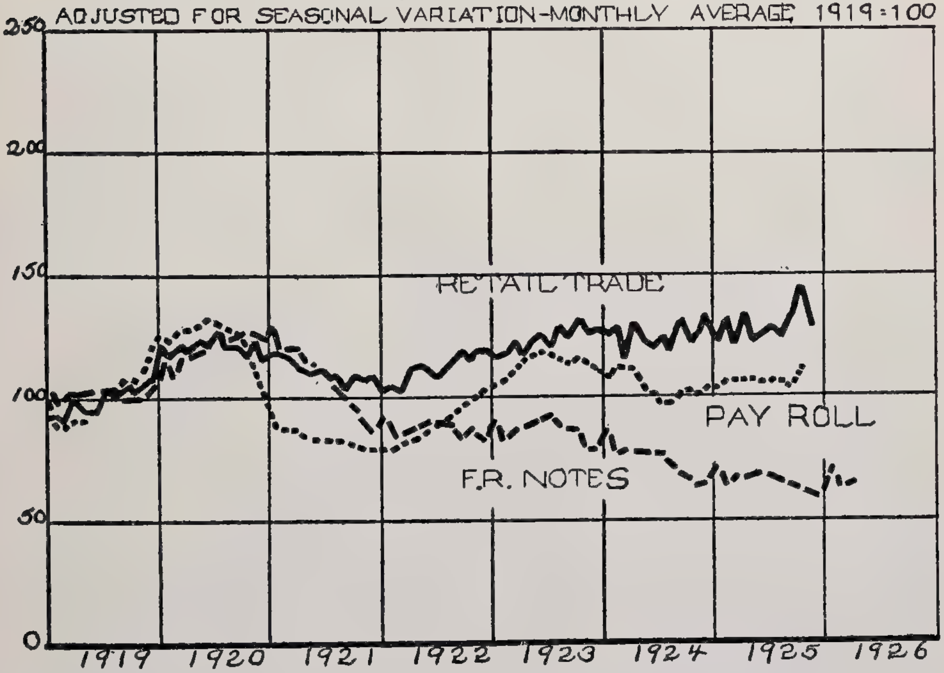
If the country were to go through a period of scarcity of gold supply, accompanied by a growing need for money due to increased population and increased business, the Federal Reserve note would not provide a means for preventing the long-time decline of prices. If gold were scarce, Federal Reserve notes could not be issued to make up the scarcity, since a substantial minimum gold reserve is required as a basis for note issue. Clearly, therefore, the elasticity of the Federal Reserve note is not such as to insure automatic adaptation of the long-time supply of currency to the long-time needs of trade, unless supplemented by some outside control. So far as the automatic secular elasticity the Federal Reserve note may offer is concerned, we shall in the future as in the past, be the sufferers alternately from long-time periods of inflation or deflation of the price level.

Cyclical Elasticity.—Those fluctuations in business which are commonly designated as the business cycle cause corresponding fluctuations in the demand for currency. The Federal Reserve note should respond to these changing needs of trade, without permitting overexpansion and inflation in time of prosperity or scarcity of currency in time of crisis.

Inasmuch as hand-to-hand currency is used chiefly in retail trade and payroll transactions, these two items may well be selected to measure the cyclical fluctuations in demand for currency. Wholesale trade, stock market transactions, and other lines of activity are carried on almost entirely by the use of checks or other forms of credit. The accompanying chart, therefore, compares Federal Reserve notes in circulation from 1919 to 1926 with payrolls and retail trade in the United States during the same period.

CHART NO 4

NOTE ISSUE
AND THE BUSINESS CYCLE



During the wave of violent prosperity in 1919 and the first half of 1920, the increase in Federal Reserve notes corresponded very closely with the increase in retail trade and payrolls. This correspondence has been interpreted by some to mean that note issue possessed ideal elasticity in responding to the needs of trade. However, such an interpretation is open to grave objections. Fundamentally, the increase of currency permitted, and, at least in part, contributed to a great wave of inflation and speculation. If the system of note issue had possessed the virtue of automatic redundancy, it would have resisted the tendency to over expansion which emphatically asserted itself. Later, in 1920 and 1921, retail trade and payrolls both underwent a pronounced cyclical decline. However, Federal Reserve notes, instead of ushering in the trade readjustment, lagged behind it. The note curve on the chart is the last of the three curves to register a contraction and a return to more normal levels.

Although eventually note issue displayed the power of contraction, it is proper to emphasize that this contraction was belated. Had the note issue possessed automatically the power to resist inflation in the first place, the necessity for the deflation would never have presented itself.

During the period after 1921, the substitution of gold certificates for Federal Reserve notes had an important bearing on cyclical fluctuations of currency supply. The elastic element in the currency was in reality gold certificates plus Federal Reserve notes, rather than Federal Reserve notes alone. The Federal Reserve Banks during this period had begun to take a new view of the problem of elasticity. Currency issuance was no longer left to automatic self-control. The Federal Reserve Banks acknowledged a responsibility for preventing excessive inflation. They deliberately controlled the discount rate and their open-market purchases with a view to preventing a repetition of the excesses of 1919-1921. The period from 1922 on, therefore, represents not a test of automatic elasticity, but a test of controlled and managed elasticity. This regulated elasticity has aided in preventing extreme fluctuations in trade and currency.

Throughout the period, 1919-1921, there was a disposition on the part of Federal Reserve officials to deny that overissue of Federal Reserve notes could possibly be a cause of inflation. For instance, on August 8, 1919, the Federal Reserve Board published the following declaration: "The difficulty, indeed the impossibility, of keeping in circulation an excessive volume of Federal Reserve notes should be understood."[1] One reason for this belief was the observation that note issues did not increase until *after* prices had gone up and did not decrease until *after* prices had come down. As a result of this observation, the Federal Reserve

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[1] *Federal Reserve Bulletin*, August, 1919.

Board further declared: "The increased volume of Federal Reserve notes in circulation during the past three years . . . is the *effect* of advancing wages and prices and not their *cause*."

Although this view was officially held, it was severely criticised by economists, and it differed from the opinion of at least one member of the Federal Reserve Board. Thus, on December 21, 1918, Mr. A. C. Miller, of the Federal Reserve Board, declared:

> Our elastic note issue system has enabled us to place the issue of paper dollars on a quantity basis. . . . Our difficulty is, and therein consists our inflation, that dollars—good financial dollars, "safe dollars," gold dollars—have been created in such abundance in comparison with the amount of goods purchaseable by them that they have, as a necessary result, lost in their purchasing power. . . . In other words, the supply of money has become disproportionate to the supply of goods, with rising prices as the inevitable result.[1]

Even though the major advances in prices preceded in order of time new issues of notes, nevertheless the fact that notes had expanded in the meantime made each successive price advance more inevitable. The process was cumulative. Higher prices seemed to require more currency with which to do business. But as soon as more currency was issued, it merely made possible a further jump of prices.

This fact is recognized by W. P. G. Harding, former Governor of the Federal Reserve Board when, writing in 1925 and looking back upon the post-War inflation, he declares:

> Continuous credit inflation inevitably leads to currency inflation, and currency inflation is always progressive, making necessary time and again recourse to the printing press. To prevent a catastrophe, a halt has to be called at some point.[2]

In this remark, Mr. Harding distinguishes *credit* inflation from *currency* inflation and points out that the former precedes the latter. The inference is that if credit inflation is prevented in the first place, there will be no occasion for currency inflation,—an inference which tends to load the whole blame for inflation on credit expansion alone. It is doubtful, however, whether we should so freely absolve currency issue from joint responsibility for inflation. Currency and credit expand in intimate association, and unless both are controlled with a view to prevention of extreme fluctuations, the violent ups and downs of the business cycle are left beyond control. Given an adequate control of note issue, discount rates and credit conditions in general by the Federal Reserve institutions, the system of note issue does possess a degree of elasticity which is safe. Recognizing the necessity for some form of control, the Federal Reserve Board has announced certain general and fundamental principles to govern their action. In July, 1926, the Federal Reserve Bulletin explains their policy as follows: [1]

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[1] Harding, W. P. G., *The Formative Period of the Federal Reserve System*, p. 136.

[2] *Ibid.*, p. 166

> The distinction between the Federal Reserve Agents and the Federal Reserve Banks in their relation to Federal Reserve note issue is in practice largely one of internal administrative routine, and the Federal Reserve Board has never applied the special interest charge for note issues authorized in the act, nor has it ever directly limited the volume of Federal Reserve notes in circulation by refusing to authorize an issue. The Board has taken the view that no special policy of control of note issue is desirable or necessary and that changes in the volume of Reserve Bank credit in use, whether they arise from the creation of deposits or from the payment out of notes, can best be regulated as a part of the system's general discount and open-market policy.

This general statement not only announces a positive policy of including note issue as a factor in "general discount and market policy," but also refers to two possible forms of regulation of note issue which the Federal Reserve Board has declined to use. First, regulation might take the form of an interest charge imposed upon Federal Reserve notes, to be calculated on the portion of such notes not covered by gold collateral. If such an interest charge were to be imposed, either the Federal Reserve Banks would add the charge to their discount rate and pass it on to member banks, or they would absorb the charge as part of their own costs. In either case, the result would be objectionable. If they added the charge to the discount rate, this rate would be subject to a wholly abnormal form of control. The rate should be fixed in the first place in accord with the dictates of a fundamentally sound credit policy. If the rate is fixed properly, then to add thereto an arbitrary interest tax would cause precipitate deflation and far-reaching financial disturbance. If, on the other hand, the charge were to be absorbed by the Federal Reserve Banks, it would have no effect as a deterrent on member banks in applying for additional note issues. Consequently, if the discount policy is sound in the first place, an interest tax on note issue is either harmful or inconsequential.

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[1] *Federal Reserve Bulletin*, July, 1926, p 478.

The second form of regulation referred to and rejected by the Board would be a direct limit on the total volume of notes issued. In case of emergency, it would still be necessary to declare a suspension of such limits, much after the fashion of the suspension of currency limits in various European countries. Moreover, if the discount rate is fixed at the right point, it is very unlikely that the need for such an arbitrary limitation will ever present itself. Consequently, the problem of control simmers down primarily to a problem of sound discount policy and open-market policy on the part of the Federal Reserve institutions. The general policies of the Board and of the Reserve Banks in these respects must take into account the volume of note issue. But this would be only one factor among many. For discussion of other factors, see Chapter XXII. Hence, cyclical control of note elasticity should be looked upon simply as part of the much larger problem of control of the credit system in its entirety.

While note issue is being considered from the cyclical standpoint, it is important to take into account the theory set forth by certain statisticians that wide cyclical fluctuations, either of credit or of currency, are uncalled for. For instance, the studies of this problem indicate that the velocity of bank deposits varies in close correspondence with the fluctuations of the business cycle.[1] The cyclical demands of trade are met by a cyclical fluctuation in velocity of circulation of currency and credit. The same number of dollars, by virtue of a more rapid rate of turnover, should accommodate the larger needs of trade during a period of prosperity. The same number of dollars, by a less rapid rate of turnover, should satisfy the needs of trade during depression. In so far as the need for cyclical elasticity is met by cyclical changes in rate of circulation, there is no need for cyclical changes in volume of circulation. If this assumption is finally verified in full, the logical conclusion would be that any increase in note issue beyond what is called for by the long-time rate of growth and by mild seasonal fluctuations is to be viewed with suspicion—suspicion that inflation is under way. In brief, what is called for, in light of cyclical needs, is stability of note issue rather than elasticity. A noncyclical volume of currency, by virtue of changes in rate of circulation, would accommodate the needs of business alike in prosperity and depression. Although this conclusion cannot be set down in a very dogmatic form at present, nevertheless it seems to be the direction in which the most recent and competent statistical evidence points.

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[1] See below, pages 391-392.

In summary, we may observe that the original conception of a Federal Reserve note which should be automatically self-regulating in volume was illusory. Of the four main types of fluctuations in currency volume which occur, only the seasonal type displays anything like an adequate power of self-regulation. With regard to the secular trend, there is neither a capacity for automatic self-regulation nor any power on the part of the Federal Reserve Banks deliberately to control note issue with a view to meeting correctly the needs of trade and avoiding prolonged inflation or deflation. With regard to cyclical fluctuations or to fortuitous fluctuations such as those of war, the automatic self-regulation of note issue is inadequate and requires to be supplemented by purposeful control on the part of the Federal Reserve authorities. This purposeful control chiefly takes the form of manipulation of the discount rate or of operations in the open market with a view to tightening or easing the market as the case may require.

Note Issue and Reserve Bank Credit.—Most fluctuations in member bank demand for Reserve Bank credit are due to the changing needs for currency rather than to the changing needs for reserves to back up deposit liabilities at member banks. To quote the Federal Reserve Board: "In the experience under the Reserve system, changes in the demand for currency in the absence of gold imports have been the principal factor accounting for fluctuations in the total volume of borrowing."[1]

To understand the significance of this statement, we need to analyze the sequence of events when credit and currency are expanding. The demand for new credit is manifested, first of all, in the granting of credits which are used to build up deposits of business men at their banks. At first, the payments employing these new funds are made primarily by check, draft, or other credit instruments. As long as the payments remain in these forms, there is little additional demand for actual currency. Book credits meet the needs of the occasion. However, in the course of a short time, business men are obliged to meet larger payrolls and these payrolls involve the necessity for actual cash. Moreover, as soon as the goods reach the hands of retailers, the payments across their counters require a proportionately large amount of actual currency. As soon as these demands are felt, they result in withdrawals of actual cash from the member banks. Then it is that the member banks turn to the Federal Reserve institutions for additional cash. However, before they can obtain additional currency, it is usually necessary for them to rediscount with the Reserve institution. Such rediscounts give the member banks a credit against which they can draw; and when they draw in this manner, they request actual currency.

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[1] *Tenth Annual Report*, 1923, p. 24.

One important exception to this explanation of the need for rediscounting in order to obtain new currency must be made. The exception occurs under conditions of an excess of gold imports. If gold is being imported heavily, the member banks can deposit the gold with the Reserve Banks and receive gold certificates for circulation purposes. They do not need to rediscount with the Federal Reserve, and the Federal Reserve does not need to resort to note issue. In the absence of such gold imports, member banks will rediscount heavily in order to obtain the currency. Consequently, the demand for currency will be reflected: first, in the expansion of reserve bank credit, *i.e.*, rediscounts; second, in the expansion of Federal Reserve notes, unless gold has been imported heavily, in which case gold certificates will probably be circulated instead of additional notes.

When the member banks desire additional credit, it makes a very wide difference whether they desire this credit in order to build up their book reserves against demand deposits or to increase their currency supply. If the sole purpose of the new credits established with the Federal Reserve is to build up reserves against demand deposits, the amount of such new credits need be only 7, 10, or 13 per cent of demand deposits in the member banks. That is to say, the legal reserve ratio of 7, 10, or 13 per cent, according to the location of the member bank, will determine the amount of new reserves necessary to back up new demand deposits. Consequently, an expansion of deposits of member banks will not require more than a small fractional increase in rediscounts to afford ample reserve backing. The situation, however, stands in sharp contrast as soon as the member banks request currency from the Federal Reserve. Immediately, the demand for Reserve Bank credit is not a mere fraction of the member bank needs, but is a dollar for dollar requirement. As explained by the Federal Reserve Board: "The demand for reserve bank credit, which, so long as the customer required only an increase in his checking account, was on the average only $1.00 of reserve bank borrowing to every $10.00 of member bank deposit liability, turns into a demand for $10.00 of reserve bank borrowing to $10.00 of currency demand when the customer requires cash." [1]

These matters are of deep importance in interpreting the reserve ratio of the Federal Reserve Banks as well as in interpreting discount policy or credit conditions in general. In the absence of abnormal gold movements, fluctuations in the reserve ratio are commonly due, for the most part, to changes in Federal Reserve Bank credit, and these in turn reflect for the most part fluctuations in currency demand. Changes in deposit liability of the Federal Reserve Banks have had a relatively minor influence in determining the volume of Reserve Bank credit and in altering the reserve ratio of Federal Reserve Banks; whereas changes in note liability have had a major influence. In light of these factors, the Federal Reserve Board states: "Federal reserve banks, therefore, from the point of view of the chief use made of their credit, may be regarded as currency supplying banks." [2]

These important phases of note issue can be better understood from examination of the accompanying charts. Section I of Chart No. Five indicates the divergence which occurs from time to time between Federal Reserve notes and gold in circulation. For a time prior to 1921, Federal Reserve Banks were trying to conserve gold and to meet the demand for additional currency by expanding Federal Reserve notes. Following 1921, however, the Federal Reserve Banks wished to absorb enormous gold imports and to avoid price inflation. As a result, they met the currency demand largely by paying gold out into circulation and contracting Federal Reserve notes in circulation.

Section II of Chart No. Five shows that as the stock of gold increased after 1920, the rediscounts of the Federal Reserve Banks decreased. In other words, currency demand was being met by depositing gold at the Federal Reserve Banks, and the member banks found it unnecessary to rediscount heavily in order to obtain their currency requirements. The experience of this period is indicative of what might normally be expected under conditions of heavy gold imports. The new gold relieves the member banks of the need for additional Federal Reserve rediscounts. Except when such gold imports are being received, however, an additional currency demand will be accompanied by additional rediscounts and additional issues of Federal Reserve notes.

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[1] *Federal Reserve Bulletin*, vol. IX, 1923, p. 1254.

[2] *Tenth Annual Report*, 1923, p. 28.

CHART NO 5

CURRENCY FLUCTUATIONS AND RELATED FACTORS

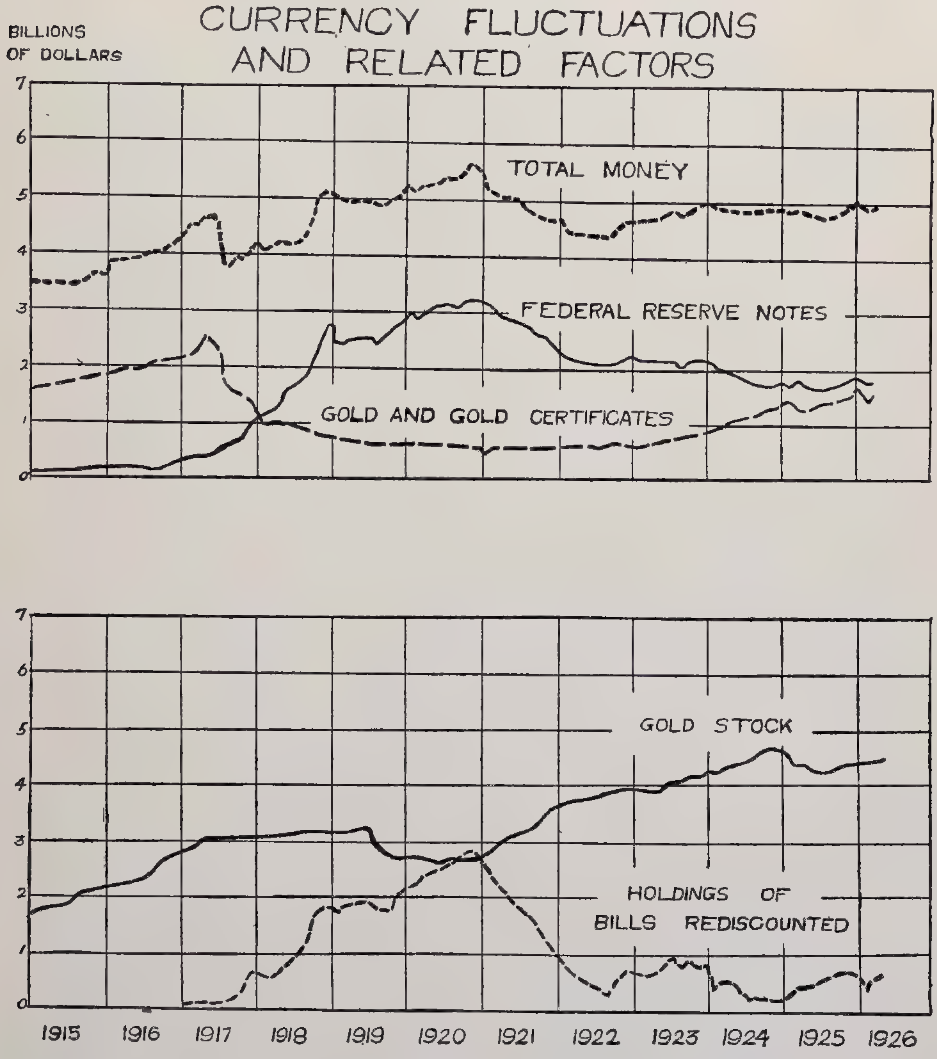
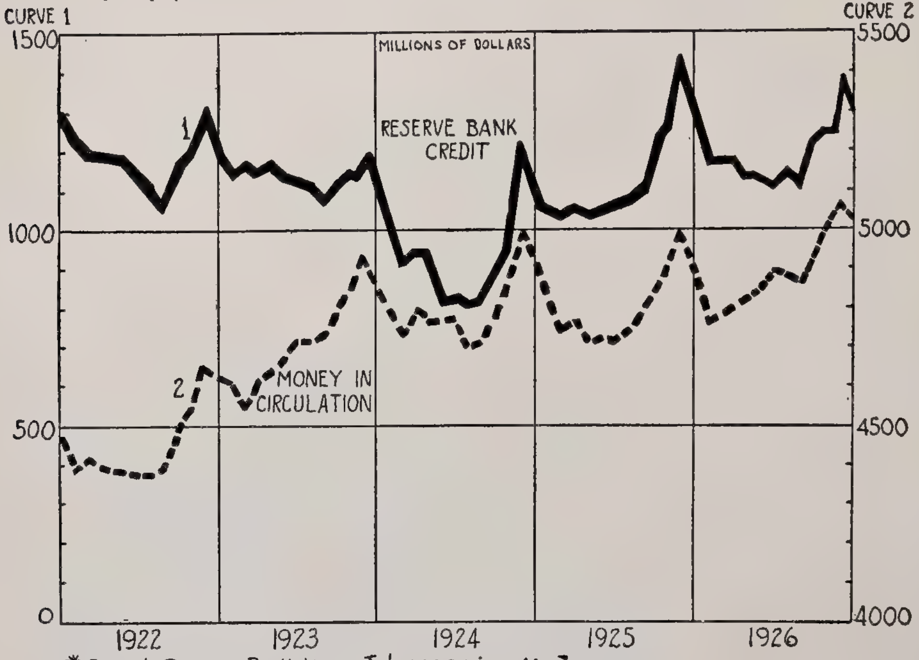


Chart No. Six compares currency in circulation with rediscounts plus open-market purchases. It is necessary to use both rediscounts and open-market purchases as a measure of Reserve Bank credit, inasmuch as a change in the total volume through either source has much the same effect upon the tightening or easing of general financial conditions. The fundamental correspondence between these two curves is obvious and bears out the

CHART NO 6

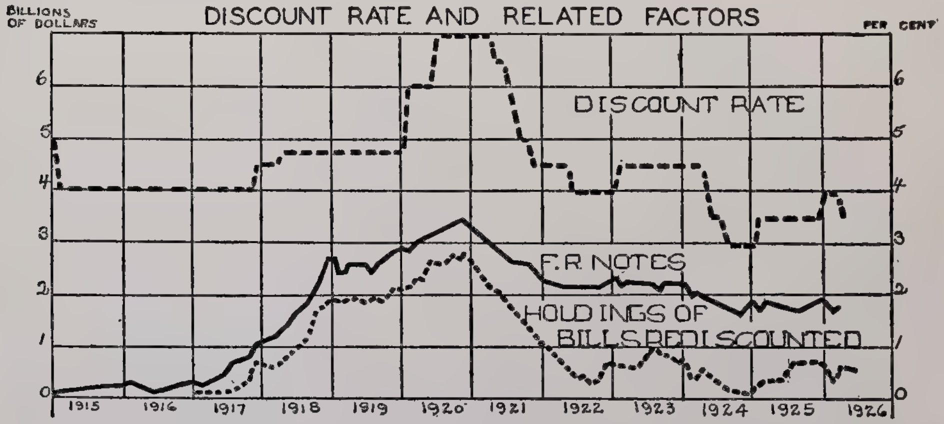
CURRENCY AND RESERVE BANK CREDIT*



*Federal Reserve Bulletin; July, 1926, p. 469

CHART NO 7

DISCOUNT RATE AND RELATED FACTORS



conclusion that the chief factor in determining fluctuations in Reserve Bank credit is the changing demands of member banks for currency.

Chart No. Seven compares the official rediscount rate of the Federal Reserve Banks with the volume of notes in circulation and with rediscounts. This comparison is chiefly significant because part of the problem under discussion is the use of the discount rate as a weapon of control over currency and credit. The raising of the discount rate in 1920 played an important part in checking the expansion both of Federal Reserve notes and of bills rediscounted. In 1923, and again in 1925, increases of the discount rate, although relatively moderate in amount, exerted an influence in checking expansion of currency and Reserve Bank credit. Federal Reserve authorities, in using the discount rate as a means of control, are keenly aware of the fundamental importance of currency demand in governing Reserve Bank credit and reserve ratios.

From the foregoing discussion, it should be clear that the problem of currency control is intimately related to the whole problem of Reserve Bank credit. Note issue is not an isolated and independent force, but is closely interwoven with the reserve ratio, the volume of rediscount, the open-market policy, and the total earning assets of the Federal Reserve Banks. The note issue policy is an important part of the whole fundamental policy of the Federal Reserve institutions. A broad comprehensive view of the interrelationships prevailing is indispensable to an understanding of the broad problem of currency supply.

In conclusion of this section, the following principles are to be noted:

1. Bank credit expands first and is shortly followed by an expansion of currency.
2. The credit expansion requires only a fractional reserve backing (13, 10, or 7 per cent of demand deposits, 3 per cent of time deposits); hence, rediscounts increase only mildly as a means of building up reserves against demand deposits of member banks.
3. The currency expansion is accompanied by practically a dollar-for-dollar rise in rediscounts as a means of enabling member banks to claim cash from the Federal Reserve Banks.
4. Rediscounting for either purpose is unnecessary when gold imports are excessive.

5. Changes in demand for Federal Reserve Bank credit are chiefly governed by changes in demand for currency, except at a time when gold imports are excessive. Gold supply remaining constant, the reserve ratios of Federal Reserve Banks principally reflect changes in note liabilities rather than changes in deposit liabilities.

6. Control of note issue as part of general discount and open-market policy is an acknowledged criterion of Federal Reserve policy.

Some Administrative Details of Note Issue.[1]—Federal Reserve notes are constantly being worn out or mutilated. Consequently, each Federal Reserve Bank sorts all notes coming into its possession into two groups, "unfit" and "fit." The "unfit" notes are returned to the Comptroller of the Currency to be destroyed. The "fit" notes may be put back into circulation if they were originally issued by the same Bank, but if originally issued by some other Federal Reserve Bank, they must be returned to such Bank or to the Treasury Department for retirement. As previously explained, one Federal Reserve Bank cannot reintroduce into circulation another Federal Reserve Bank's notes. An incidental but important result of this constant inspection to determine the fitness of notes is the prompt discovery of counterfeit bills which get into circulation from time to time.

The cost of issue and redemption of Federal Reserve notes falls upon the Federal Reserve Banks. This cost includes the expense of procuring, issuing, shipping, and retiring notes. During the year 1925, the twelve Federal Reserve Banks received and counted 1,947,419,000 separate pieces of currency. These pieces handled and sorted represented a value of $11,556,980,000. The original cost of issuing and shipping Federal Reserve currency in that year was $1,606,453, and the cost of redemption including shipping charges was $196,465, making a total cost for issuance and shipping of $1,802,918. This cost does not include the clerical expense of sorting the notes.

The fact that the Federal Reserve Banks bear the cost of shipping the notes to member banks is especially significant in that it stimulates the member banks to call freely for the service of note issue. The cost of putting the notes into circulation does not fall upon the member banks and hence they are not deterred from adding to the currency supply when the demand for new currency presents itself.

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[1] See *Federal Reserve Banking Practice* by H. P. Willis and W. H. Steiner, pp. 126–131, for forms and schedules used in issuance of notes.

Conclusions.—Although mechanical details of note issue are important, they should not distract attention from the broad fundamentals of sound currency policy. The basic principles of currency control are the important points for consideration. In light of the discussion contained in the present chapter, it should be evident that the Federal Reserve note is incapable of adequate self-regulation (with the possible exception of purely seasonal elasticity). It requires outside control. The authority competent to exercise this control is the Federal Reserve Board and the Federal Reserve Banks.

Experience has dictated that exigencies of gold import and export should influence the extent to which gold should be paid into circulation as a substitute for Federal Reserve notes. The War and post-War period presented highly abnormal gold conditions, and as the countries of the world return gradually to more normal financial circumstances, the influence of gold import and export upon currency policy will doubtless become less important. The main weapons of control are the discount and open-market policy of the Federal Reserve institutions. These are the only sources of control adequate to prevent a repetition of the inflationary extremes of 1919 and 1920. Even this instrument of control, however, is inadequate to protect the United States against the long-time swings of the price level. Such protracted declines or inclines as have characterized price history during the last century and a quarter cannot be controlled by the discount and open-market policy of the Federal Reserve authorities. This problem requires separate solution. Some of the factors affecting such a solution are discussed later in the present volume.[1]

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[1] See Chapters XXII-XXIII.

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Chapter IX

THEORY OF THE VALUE OF MONEY

The Meaning of the Value of Money.—A very large part of the economic literature dealing with the subject of money is devoted to the problem of the value of money. Likewise a very large part of the interest in the subject on the part of men of practical affairs arises from the fluctuations in this "measuring-stick of value." Indeed, it would not be very great overemphasis to say that, in the hands of most writers, monetary theory is *value theory* applied to the specific object, money.

The value of money may be thought of as the power of money to command goods in exchange for itself. Value is purchasing power. This definition involves a comparison between two things, money and the things purchased with money. Such a comparison is often confusing because it differs in an essential way from value comparisons in our everyday experience. Ordinarily we compare an individual commodity with money, or compare two individual commodities with each other by expressing the price of each in terms of money. Thus we are accustomed to comparing money with individual commodities. But when we speak of the value of money, we are required to compare money with commodities *in general*. We are required to visualize the purchasing power of money over all individual goods taken collectively.

Where the gold standard prevails, the unit of reckoning is a fixed weight of the metal. In the United States, the value of the dollar means the general purchasing power of 25.8 grains of gold nine-tenths fine. If today this unit buys X goods and a year from today it buys 2X goods, its value has doubled. Where the paper standard prevails, the unit of value is simply the nominal counter or money ticket declared by law and accepted by custom as the unit of account. The value of such a paper unit, to the extent that it gives the holder power to purchase goods, is just as genuinely and truly value as the value of a gold unit.

In comparing the value of the money unit with goods in general, we face the difficulty that the unit—a dollar, for instance—is a very small unit, and goods in general are a very comprehensive total. A dollar's worth of goods in general is a concept which forces us to think of a composite group of goods which will exchange for a dollar. Such a composite group would consist of minute fractions of thousands of goods and services, the size of each fraction depending upon the relative importance of the respective good in the total trade of the country. The value of the dollar changes accordingly as the size of this weighted composite of goods changes. This notion of the value of money is useful as a conceptual device or thinking tool, but it does not lend itself readily to statistical computation. It requires to be supplemented by a statistical definition.

Statistically, changes in the value of money are the reciprocals of an index number measuring fluctuations in the general average of prices. Early writers on monetary theory assumed that a general average of prices, though desirable, was not feasible or practicable. Some such writers singled out a basic necessity, such as corn, and assumed that the price fluctuation of the one article roughly indicated the general change in prices. Later writers developed index numbers of wholesale prices and assumed that this group of prices could be taken as measuring with fair approximation changes in the general average of all prices. More recently, this assumption has been denied and composite index numbers have been attempted which average together wholesale and retail prices, security and real estate prices, wages and rents, and other special groups of prices. A very broad average of this kind comes much nearer to being a true picture of changes in the general purchasing power of money than does the wholesale index or any other index taken by itself. If we want a reliable measure of the general value of money, we must make our price average truly comprehensive and inclusive.

However, for a great many purposes, we want, not the general purchasing power of money over every conceivable kind of goods or service, but the purchasing power of money over goods or services in a specific kind of market. Thus, we may want to find the changed purchasing power of the business man's dollar over goods at wholesale, or of the consumer's dollar over goods at retail, or of the speculator's dollar over securities in the stock market, and so on. Consequently, when referring to the value of the dollar, we need to specify whether we are dealing with value in general or value in a particular market. A very wide dispersion may take place in the component parts of the general average of prices, but such internal fluctuations may cancel and leave the general average unchanged. Always, therefore, the question should be raised: Value for what purpose? And the selection of price indexes must correspond with the purpose. Money, according to this view, has not one value, but several values, depending upon the type and kind of goods and services brought under consideration.

The higher the rise of prices in a given market, the lower the value of money. With this notion we are all familiar, since as consumers we experience the fact that a rising cost of living lessens the purchasing power of our incomes. As a matter of arithmetic, we express this inverse relationship of prices and purchasing power by saying that the purchasing power of money varies with the reciprocal of the change in the price index. Thus if prices rise 100 per cent, the value of money falls 50 per cent; if prices fall 25 per cent, the purchasing power of money rises 33 1/3 per cent. The reader should note that prices may rise by any finite per cent, but that the purchasing power of money never falls by more than 100 per cent. To illustrate, wholesale prices in England were at an index of about 300 in 1920 (1913 = 100). Later the index fell to about 150. On the increase, the percentage rise of prices was 200 and the percentage fall of purchasing power was 66 2/3. On the decrease, the percentage fall of prices was 50 (not 150, which was merely the number of points decline in the index number), and the percentage rise of purchasing power was 100. In Germany, when the wholesale price index rose trillions per cent, the purchasing power of the mark fell over 99 per cent, but not a full 100 per cent. A fall of 100 per cent would mean that the money was absolutely worthless, or had a zero value. A fall of more than 100 per cent would mean that sellers of goods were not only giving goods away but were paying buyers a premium for taking the goods. It may seem unnecessary to draw attention to the absurdity of a fall in prices of more than 100 per cent, but one has only to read the financial columns of various newspapers to discover how widespread the erroneous conception is.

It is well also to clarify our notions of four terms commonly used in referring to changes in the value of money; namely, inflation, deflation, appreciation, and depreciation. The precise meaning which should attach to these terms is by no means a matter of agreement among economists, but in the present treatise, inflation and depreciation are used to refer to any rise of prices (or, reciprocally, any fall in the value of money), and deflation and appreciation are used to refer to any fall of prices (or, reciprocally, any rise in the value of money). This usage of terms has the advantage of simplicity, but such usage will not be intelligent in the hands of the average student of these matters unless a few qualifying factors are clearly understood. Kemmerer has stated that inflation occurs "when, at a given price level, a country's circulating media—money and deposit currency—increase relatively to trade needs." [1] The difficulty with any such definition is that it throws the whole matter back upon a purely arbitrary notion of "trade needs." The needs of trade are not objectively fixed and the room left for difference of opinion is so great as to render the concept hopelessly ambiguous.[2] Another view is that inflation is "an amount of credit furnished to the country in excess of what the country needs for conducting a given volume of business." [3] Other authorities have tried to limit inflation to the rise of prices under the influence of excess fiat paper money issued by governments in time of war.[4] O. M. W. Sprague offers the following very elaborate definition: [5]

> I regard inflation as a condition marked in its development, among other things, by a rapid rise in prices, continued for a number of years, which manifests itself in the business world by the appearance and development of a seller's market, extending over the entire range of commodities, a condition in which business concerns enlarge their capital, in the endeavor to produce additional quantities of goods in anticipation of an increased demand for such products at rising prices,

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[1] KEMMERER, E. W., *High Prices and Deflation*, 1921, p. 4.

[2] STEWART, W. W., *Hearings on the Strong Bill, Committee on Banking and Currency*, House of Representatives, 1926–1927, p. 787. "Six or eight men gathered together to determine what is meant by inflation and deflation would give rise to endless controversy as to meanings."

[3] STRONG, BENJAMIN F., Governor of the Federal Reserve Bank of New York, *Hearings, ibid.*, p. 375. Compare W. T. FOSTER and W. CATCHINGS, *Money*, 1924, p. 55. "We use the term inflation to denote any increase in the volume of money that is accompanied by a rise of the general price level." According to these views a rise of prices due to a cause other than excess credit would not be inflation. This is too narrow a definition.

[4] See PIGOU, A. C., "Inflation," *Economic Journal*, vol. XXVII, 1917, pp. 486–494.

[5] *Hearings, ibid.*, p. 404.

and, consequently, increase their capital equipment without regard to the fact that it is increasing rather than reducing their unit costs of production. It manifests itself in a particularly serious form in connection with agriculture, because it results in the transfer of land at increased prices, with a growing burden of mortgage indebtedness. We have as a result a gradual deterioration in the quality of the assets of the banks; we have people more and more making commitments which depend for success upon a still further increase in prices and in these circumstances the demand for credit becomes more and more insistent, and if supplied, it affects prices of all sorts.

This definition amplifies the description of one particularly acute type of inflation, but certainly there are many types which do not correspond with this description. We can best escape from the confusion by designating any general rise in prices as inflation, and then classifying such inflation according to certain clearly defined types. Thus, we may have secular inflation, war-time inflation, cyclical inflation, and so on. This method has the advantage at once of precision and simplicity.

The terms depreciation and appreciation may be used to refer to the value of paper money in terms of gold instead of goods. Thus, at a time when 250 dollars of greenbacks were required in order to exchange for 100 dollars of gold, the paper money was depreciated in terms of gold. When this premium on gold diminished, paper appreciated in value in terms of gold. Some writers use "specific depreciation" to describe this loss of value on the part of paper money, and "general depreciation" to describe the loss of value in terms of goods when prices rise. In the present volume, depreciation and appreciation have reference to the value of money in terms of goods, except where the other meaning is explicitly noted. These matters have to do only with nomenclature, but they are none the less of vital importance if we are to be consistent and accurate in analysis of monetary problems.

The Quantity Theory.—There is no better way to state the classical form of the quantity theory than to repeat certain famous passages from the works of John Stuart Mill:

We are now called upon to consider what would be the effect of an increase of money, considered by itself. Supposing the money in the hands of individuals to be increased, the wants and inclinations of the community collectively in respect to consumption remaining ex-

> actly the same; the increase of demand would reach all things equally and there would be a universal rise of prices.
>
> It is to be remarked that this ratio would be precisely that in which the quantity of money had been increased. If the whole money in circulation was doubled, prices would be doubled. If it was only increased one-fourth, prices would rise one-fourth.
>
> The value of money, other things being the same, varies inversely as its quantity; every increase of quantity lowering the value, and every diminution raising it, in a ratio exactly equivalent.
>
> The amount of goods and of transactions being the same, the value of money is inversely as its quantity multiplied by what is called the rapidity of circulation. And the quantity of money in circulation is equal to the money value of all the goods sold, divided by the number which expresses the rapidity of circulation.
>
> That an increase of the quantity of money raises prices, and a diminution lowers them, is the most elementary proposition in the theory of currency, and without it we should have no key to any of the others.
>
> The amount of purchasing power which a person can exercise is composed of all the money in his possession or due to him, and of all his credit. For exercising the whole of this power he finds a sufficient motive only under peculiar circumstances; but he always possesses it; and the portion of it which he at any time does exercise, is the measure of the effect which he produces on price. . . . Credit, in short, has exactly the same purchasing power with money; and as money tells upon prices not simply in proportion to its amount, but to its amount multiplied by the number of times it changes hands, so also does credit. . . . Credit which is used to purchase commodities, affects prices in the same manner as money. Money and credit are thus exactly on a par, in their effect on prices.
>
> The quantity of a paper currency not convertible into the metals at the option of the holder, can be arbitrarily fixed; especially if the issuer is the sovereign power of the state. The value, therefore, of such a currency is entirely arbitrary. . . . The immediate agency in determining its value is its quantity. The issuers may add to it indefinitely, lowering its value and raising prices in proportion.[1]

The doctrine as thus expounded emphasizes that the rise in prices will be *exactly proportionate* to the rise in quantity of money, but carefully surrounds this law with the provision, *other*

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[1] *Principles of Political Economy*, book III, ch. VIII, IX, XII, XIII.

things remaining the same. It takes into account the element of the *rapidity of circulation* of all parts of the circulating medium. It extends the theory of value to include *credit and bank notes* as well as specie, and to include *inconvertible paper money* as well as commodity money. These are the basic elements of the classical quantity theory. They are not for the most part original with Mill, but they are for the first time assembled by him in a comprehensive, unified, systematic theory of value.[1]

The salient features of the quantity theory may be expressed in the form of an algebraic equation. The form of algebraic statement which has won most common usage is that worked out by Irving G. Fisher: $MV + M'V' = PT$.

The terms of this equation require definition.[2] M is money in circulation (coin and paper currency), excluding bank reserves and treasury stock.[1] M′ is checking accounts, measured by individual deposits at the banks or by demand deposits. V is velocity of circulation of money, ascertained by dividing the total volume of money payments in a given period by the number of pieces of money in circulation. V′ is velocity of circulation of deposits, ascertained by dividing the total volume of check payments (bank debits to individual account) in a given period by the average number of dollars of deposits during that period. P is an index of prices. T is the volume of trade.

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[1] The historian of economic thought can readily show that Mill merely restated the quantity theory as it was conceived by Ricardo and others. Some of the Ricardian point of view is evident from the following quotations:

"That commodities would rise or fall in price, in proportion to the increase or dimunition of money, I assume as a fact which is incontrovertible. . . .

"The value of money, then, does not depend wholly upon its absolute quantity, but on its quantity relative to the payments which it has to accomplish; and the same effects would follow from either of two causes—from increasing the uses for money one tenth—or from diminishing its quantity one tenth; for in either case, its value would rise one tenth.

"There is no point more important in issuing money than to be fully impressed with the effects which follow from the principle of limitation of quantity. It will scarcely be believed fifty years hence, that bank directors and ministers gravely contended in our times, both in Parliament and before committees of Parliament, that the issues of notes by the Bank of England, unchecked by any power in the holders of such notes to demand in exchange either specie or bullion, had not, nor could have, any effect on the prices of commodities, bullion, or foreign exchanges."

See *Works of Ricardo*, edited by J. R. McCulloch, 1888, pp. 93, 214, 398. In order to gain a comprehensive view of Ricardo's monetary theory, one has to piece together fragments of discussion which are widely scattered in letters, pamphlets, and books. Mill's quantity theory is in large part a synthesis of Ricardo's scattered writings on the subject. But it should be noted that although Ricardo is often thought of as the founder of the quantity theory, his doctrines are after all largely a restatement of the ideas of numerous earlier students of monetary problems. For a survey of the evolution of the quantity theory, see MONROE, A. E., *Monetary Theory before Adam Smith*, 1923, especially pp. 25–32, 53–61, 108–114, 213–224; HOLLANDER, J. H., "The Development of the Theory of Money from Adam Smith to David Ricardo," *Quarterly Journal of Economics*, vol. XXV, 1911, 430–470.

[2] *The Purchasing Power of Money*, 1911, p. 53. For explanation, see Chapters II and III. For earlier forms of mathematical expression of the theory of the value of money, see NEWCOMB, SIMON, *Principles of Political Economy*, 1885, pp. 346 ff; EDGEWORTH, F. Y., *Report of the British Association for the Advancement of Science*, 1887, pp. 293 ff. KEMMERER, E. W., *Money and Prices*, 1907, ch. II.

When the terms of the equation are defined in this way, the equation becomes a truism. The number of dollars multiplied by the number of times they change hands is necessarily equal to the prices of the articles bought and sold multiplied by their quantity. This is to say that the total work done by money equals the total work done by money. The labels on each side of the equation differ, but the quantities beneath the labels are identical. Many people have disparaged the equation on the ground that it is a "mere truism." Such critics overlook the great importance of a truism as a tool of thought and as a tool of statistical investigation. If, in a maze of perplexing data, we can sift out six factors as important as those of the equation of exchange and throw them into the form of an identity, we are helped greatly in our analysis of price movements. The truism is an indispensable instrument of research and reflection in the field of monetary value.

However, the equation as such gives no clue to the lines of causation running between the various factors. The truism carries no inference whatever that M is cause of P or P is cause of M. It is absolutely void of causal implications.

To convert this neutral equation into a causation equation expressing the quantity theory, we should paraphrase Mill, and state: V, V′, and T remaining the same, double M and M′ and P must also double. This amounts to the doctrine that M and M′, money and credit, are cause, and P, the price level, is effect. As declared by Fisher, "The price level is the effect and cannot be the cause of change in the other factors. . . . The main conclusion is that we find nothing to interfere with the truth of the quantity theory that variations in money (M) produce normally proportional changes in prices."[1]

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[1] In dealing with the long-time trend of prices as influenced by gold, it is necessary to introduce monetary gold stock out of circulation as well as in circulation in the definition of M. Under a gold exchange standard, the effect of the usual definition of M is to exclude gold altogether, although it is the standard money of the country.

Demand and Supply of Money.—Whether one adopts the quantity theory or some other causation theory of the value of money, one finds it necessary to have rather definite concepts of supply and demand factors in this special branch of value theory. The theory of the value of money is a particular application of value theory in general, and the exact nature of the manner in which general value theory applies to money in particular cannot be understood until adequate concepts of the demand and supply of money are understood.

If a man enjoys an annual income of $5000, and on the average keeps in his checking account and in pocket currency $200, his demand for currency and credit is not $5000 but $200. If the banks find it necessary to keep gold reserves of $20 behind this average deposit and currency stock of $200, then the total demand for gold, currency and credit is $220. At the beginning of the month, this stock of ready purchasing power will perhaps be augmented by the deposit of a salary check. Toward the end of the month, it will perhaps be depleted by the payments of current bills and expenses. The demand for money, currency, and credit is a demand for a store of ready purchasing power large enough to enable the individual to meet his expenditures from day to day. It is a demand for an inventory of funds immediately available as a means of meeting ordinary expected expenses and of providing for unforeseen contingencies which may arise. In this supposed case, the individual finds that by keeping about 1/23rd of his income on the average in the form of quick spending power, he can adequately operate his personal budget. His demand, therefore, is for a stock of immediate spending power on the average equal to 1/23rd of his income. His demand is not for any certain absolute sum of money, but for a relative sum of purchasing power—relative, that is, to his income and expenditure.

Although this illustration is drawn from the field of household economy, or personal consumption, nevertheless the same principle applies to the merchant and the industrialist. These men in the natural course of trade find it necessary to keep a certain proportion of their resources in the most liquid form possible. The average amount of coin, currency, and demand deposits required will depend upon the income and outlay of the business. If 1/20th of the total expenditures kept in the form of money-spending power is sufficient to meet the needs of trade, that is the extent of the demand for money. Each day the business man pours into his bank account the new receipts of the day and draws out of his bank account the new expenditures of the day. His bank account is a kind of revolving fund, constantly rising and falling with new deposits and new checks drawn, but on the average amounting to a certain proportion of the total business budget. Thus the demand for money and credit is a perfectly simple and practical consideration growing out of the every-day exigencies of business.[1]

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[1] *The Purchasing Power of Money*, 1911; p. 182. Note that the equation lends itself equally well as a vehicle for expressing an anti-quantity theory of causation, *e.g.*, V, V', M and M' remaining the same, double P, and T must double; or V, V' and T remaining the same, double P and M and M' must double.

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[1] The classical view was different. J. S. Mill insisted, "The demand for money consists of all the goods offered for sale. . . . We are comparing goods of all sorts on one side, with money on the other side, as things to be exchanged against each other." *Principles of Political Economy*, vol. II, book III, ch. VIII. This definition forces one to differentiate between goods "offered for sale" and goods not so offered. But such a distinction is impossible, since *at some* price, practically all goods would be offered for sale. Where draw the line between a potential offering for sale, an actual offering without the result of a sale, and an actual sale? The concept is quite unworkable. In contrast the viewpoint of Alfred Marshall may be quoted: "Changes in the rapidity of circulation of money are themselves incidental to changes in the amount of ready purchasing power which the people of a country find it advantageous to keep in their own holding. This amount is governed by causes, the chief of which can be seen with but little trouble. It is true that comparatively few people analyze their own motives in such matters; but implicit suggestions of their motives are contained in such observations as: 'I have kept a larger stock of money than I really need: I might have used some of it in purchases for personal use, or invested it.' Opposite reflections occur when a man has spent or invested nearly all the money which he commands; and has in consequence failed to take advantage of a good bargain which came within his reach. . . . This preliminary statement indicates the general nature of a country's demand for ready purchasing power in the form of currency: or, at least, of immediate command over currency, such as is derived from keeping a considerable sum of money on current account in a bank.

"To give definiteness to this notion, let us suppose that the inhabitants of a country, taken one with another (and including therefore all varieties of character and of occupation) find it just worth their while to keep by them on the average ready purchasing power to the extent of a tenth part of their annual income, together with a fiftieth part of their property; then the aggregate value of the currency of the country will tend to be equal to the sum of these amounts. . . . Thus the position is this. In every state of society there is some fraction of their income which people find it worth while to keep in the form of currency; it may be a fifth, a tenth, or a twentieth. A large command of resources in the form of currency renders their business easy and smooth, and puts them at an advantage

On the side of supply, the important factor is the total existing stock of funds available for spending. The classical writers endeavored to limit the supply concept too narrowly. According to their view, "Whatever may be the quantity of money in the country, only that part of it will affect prices, which goes into the market of commodities and is there actually exchanged against goods. Whatever increases the amount of this portion of the money in the country, tends to raise prices. But money hoarded does not act on prices. Money kept in reserve to meet contingencies which do not occur, does not act on prices. The money in the coffers of the Bank, or retained as a reserve by private bankers, does not act on prices until drawn out, nor even then unless drawn out to be expended in commodities."[1] This definition would eliminate gold, bank reserves, and a large part of bank deposits from any influence on the price level. It raises a fictitious distinction between money in circulation and money in the bank. In order to obtain a supply concept that is useful, we need to think of supply as the existing stock of money and credit. The existing stock of gold is almost wholly cut off from actual

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in bargaining; but on the other hand, it locks up in a barren form resources that might yield an income of gratification if invested, say, in extra furniture; or a money income, if invested in extra machinery or cattle. . . . Of course, the less the proportion of their resources which people care to keep in the form of currency, the lower will be the aggregate value of the currency, that is, the higher prices will be with a given volume of currency." *Money, Credit and Commerce*, 1924, pp. 44–47.

In the same vein, Edwin Cannan writes, "The old plan was to represent the demand for currency as coming from the people who wanted to sell goods, as if these people wanted money to eat instead of merely as a means of getting other goods or services in exchange. . . . All this is now completely changed. Hoarders, defined by Mill as persons who keep money in reserve for contingencies which do not occur, and also the much more numerous persons who keep money in reserve for contingencies which *do* occur, are in the modern view the real demanders of currency, just as the persons who want houses to live in are the real demanders of houses. There is no longer any idea of balancing all the currency against some loosely conceived total of commodities for sale, but a definite conception of each person wanting to hold a sum of currency sufficient to buy her or him the collection of commodities and services which she or he is likely to have to pay for in cash before the next replenishment of the holding." *An Economists' Protest*, 1928, p. 386.

Also, it is pertinent to quote the following from R. G. Hawtrey, "The aggregate of unspent purchasing power in circulation may conveniently be called the 'unspent margin.' . . . The unspent margin is now made up of two parts, the money in circulation and the bank credits outstanding. The requirements of the community for reserves of purchasing power may be regarded as constituting the demand for credit and money." *Currency and Credit*, 1923, pp. 34–48.

[1] Mill, J. S., *Op. cit.*, book III, ch. VIII.

contact with goods. According to the classical concept it would be hoarded money and therefore no part of the supply. A workable modern concept is practically the reverse of the classical concept. The stock of money, currency, and credit serving as a store of value or hoard is the supply. Some of it may circulate rapidly and some slowly, but it is all a part of the supply of money units available to do the work of money. That this view is appropriate is evident if we compare it with the supply concept employed in the usual analysis of the supply of a commodity. The supply of automobiles is the number registered in the country, not the mere number actually rolling along the highways at any particular moment. The supply of houses is the number available to be lived in, not the mere number being moved into or out of over any particular period. And so the supply of money, currency, and deposits is the existing total stock available for spending purposes, or as reserves for funds suitable for spending purposes, not the mere amount in actual circulation at a given time.

Following out this approach to supply and demand, we may say that the value of money is adjusted by the relation between the total stock of spendable funds (supply) and the proportion of its total budget which an economic community desires to keep in the form of ready spending power (demand).[1]

[1] Mr. J. M. Keynes has attempted to formulate a theory of supply and demand of money in algebraic terms. His equation reads, $n = p\ (k + rk')$, where n = the number of units of money and currency, p = the price of each consumption unit, k = the consumption units over which the public desires to hold control in the form of cash, k' = the consumption units over which the public desires to hold control in the form of bank deposits, and r = the ratio of cash reserves to bank deposits. (See *Monetary Reform*, 1923, pp. 84–88.) A similar equation has been worked out by A. C. Pigou. (See "The Value of Money," *Quarterly Journal of Economics*, vol. XXXII, 1917.) It is claimed in behalf of these equations that they are superior to the old equation, $MV = PT$, in that they focus attention on the proportion of their resources that people wish to keep in the form of titles to legal tender instead of focusing it on velocity of circulation. To quote Pigou: "When people decide to keep as much of their resources as before in the form of titles to legal tender, this means that the velocity of circulation is doubled. This fact gives it as I think a real advantage because it brings us at once into relation with volition instead of with something that seems at first sight useless and arbitrary." (*Op. cit.*, pp. 53–54.) I find the approach of Keynes and Pigou very interesting and significant as a conceptual device, but can discover no satisfactory way of applying it statistically. If k and k' could be measured directly by dividing the cash balances of the people into their income, the result would be significant; but this is impracticable because accurate estimates of current income are not available. As a result it is necessary to estimate k and k' indirectly by

Criticism of the Quantity Theory.—The quantity theory has been severely criticised from a great many standpoints. Most of the critics would accept the general principle that the value of money is determined by demand and supply, but would disagree with the particular manner in which demand and supply are said by the quantity theorist to operate. In other words, the quantity theory is simply one possible version of the supply and demand theory. It is a version which emphasizes the importance of supply as the primary causal factor in determining the value of money. It asserts that the value of money varies in proportion to the supply, demand remaining the same. An opponent of the quantity theory can object to this particular form of the supply and demand doctrine, and yet subscribe to the supply and demand theory in some other form. Hence, criticism of the quantity theory is largely a case of matching one supply and demand theory against another. Some of the specific criticisms of the quantity theory will be considered in the following paragraphs.

(1) The quantity theory is criticised on the ground that *it is a static theory.* The term static in this connection may mean either of two things: that the quantity theory deals with only a fixed point of time, or that it deals with some normal long-run tendency under hypothetical conditions of equilibrium. The first interpretation of the word static is related to the quantity assumption that, if *at some given point of time* money were to be doubled, prices would double. By assuming a fixed point of time,

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dividing p into n. This ratio, $\frac{n}{p}$, when computed for two given dates, measures the change in the country's stock of real purchasing power, but does not indicate whether this changed stock is a greater or smaller proportion of the country's current income than the old stock was of the old income. What is wanted is a measure of changes in the proportion of their real income which people desire to hold in the form of ready command over goods. What $\frac{n}{p}$ gives is merely a measure of increase or decrease in total real stock from one date to another. Hence, as a statistical device, the new equation has a limited usefulness.

However, as a conceptual device, the emphasis upon purchasing power as a function of income is capable of being put to important uses. For instance, R. G. Hawtrey in his book, *Good and Bad Trade*, 1921, and *Currency and Credit*, 1923, has built up a significant theory of business cycles and price movements in terms of the *unspent margin, i.e.*, stocks of ready purchasing power; and of consumers' and traders' outlay, *i.e.*, additions to or subtractions from stocks of ready purchasing power. Also, Edwin Cannan has developed the concept of supply and demand in his article, "The Apparatus of Supply and Demand," *Economic Journal*, 1921, pp. 453–461, and in his book, *Money: Its Connection With Rising and Falling Prices*, 1918.

the quantity theorist endeavors to picture a situation where "other things will remain equal," and where, therefore, supply of money and value of money will move in like proportion. But if we face a real situation, we must reckon with the passing of time during the interval in which money is being doubled. War may intervene, the business cycle ebb and flow, a Federal Reserve law come into effect, a revolution in monetary habit and usage take place. All such developments would mean that other things had not remained equal and that the price level would not double in the face of a doubling of the supply of money. Attention would have to be given to all the changes in demand for money. This criticism appears to be valid. The static theory is limited to a point of time, and is purely a conceptual device. It does not fit actual conditions where demand is constantly changing.

The second possible interpretation of the term static relates to such a long-run law as the following:

> An increase of M normally causes a proportional increase of M′.
>
> An increase of M does not normally affect V,V′, or the Q's (Trade).
>
> The price level is normally the one absolutely passive element in the equation of exchange. The price level is the effect and cannot be the cause of change in the other factors.[1]

The key to this doctrine lies in the word, "normally." During the transition period from low to high prices, prices may, it is admitted, be an active instead of a passive factor. At such a time they may in some degree cause changes in all other elements of the price equation. But once the transition period has passed and prices are established on a new plateau, then, according to this static doctrine, the normal situation will prevail, prices will be passive and purely effect, not cause. To quote from Fisher's exposition,

> We have emphasized the fact that the strictly proportional effect on prices of an increase in M is only the *normal* or *ultimate* effect after transition periods are over. The proposition that prices vary with money holds true only in comparing two imaginary periods for each of which prices are stationary or are moving alike upward or downward and at the same rate.[2]

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[1] FISHER, IRVING, *Purchasing Power of Money*, 1911, pp. 158, 172, 182.

[2] *Ibid.*, p. 159.

Critics find these imaginary, stationary periods and normal, ultimate conditions quite unreal. In the real world, we are immersed in long-term movements of both demand and supply, in business cycles, in seasonal swings, and in fortuitous changes. Thus, we are always in transitional, active, dynamic stages of development. Before accepting the criticism, however, let us see a bit more clearly just what the doctrine of Fisher might mean in a real historical period. In 1927, wholesale prices in the United States were about 45 per cent higher than in 1913. The new level had prevailed since about 1921. In other words, here was a new post-War plateau of prices. Let us forget for the time being the transition period of the War, and ask ourselves: Does the mere fact that prices are now 45 per cent above the 1913 level mean that velocity of circulation need be changed or that the volume of trade need be any higher in physical volume than it would be if prices were back to the 1913 level? Obviously, neither V,V′, nor T now fluctuates much, if any, differently from what it would if prices were at the lower point. It is possible, then, to infer that prices are passive and are higher than they were in 1913 purely as the effect of increases in M and M′. When it is realized that this is what is really meant by the static or normal tendency propounded by Fisher, we can recognize validity and accuracy in it. But even so, we are laboring with the unreal assumption that if prices were not what they are, something else would be true. Surely this approach will never satisfy those who are concerned with the unrelenting, incessant time series of the real world, with secular trends, business cycles, seasonal adjustments, and irregular disturbances. A static theory is highly inadequate to explain these ever-present fluctuations. They are not mere transition periods between static calms, nor mere perturbations upon some imaginary sea of equilibrium; but they are the fundamental continuous stuff of everyday experience and reality. Something more than the static, normal concept is necessary to an understanding of these highly dynamic aspects of price behavior. It is not so much that the static theory is untrue, if construed strictly and properly, but that it is insufficient as a guide through the mysteries of price fluctuations.

(2) The quantity theory is criticised on the ground that *"other things do not remain the same."* The quantity theory, as stated by Mill, asserts direct proportionality between money and prices,

other things remaining the same, but does not assert that in fact these other things will remain the same. There is nothing inherent in the Mill formula which makes necessary the claim that other things, principally demand factors, will actually remain the same. But most quantity theorists have gone beyond the Mill assumption, and directly or indirectly, explicitly or implicitly, have declared that other things will tend to remain the same. The attack upon this assumption is amply warranted. "Other things" which change are long-time growth of trade and population, adoption of new monetary standards, new banking laws and customs, business cycles, fiscal policies, war and peace, international balances of payments, and the like. These dynamic forces are the very heart of value-making processes, and we should do all in our power to discover the forms, sequences, amplitudes, and durations of their change.

(3) The quantity theory is criticized on the ground that *it rests upon too rigid a theory of causation.* A bitter dispute has long been waged over the question: Is M the cause of P or P the cause of M? The dispute has never seemed to get anywhere, doubtless due to the mechanical notion of causation which has been rigidly adhered to by both sides of the dispute. The anti-quantity theorists were usually just as fixed and dogmatic in their notion of causation, for they were wont to contend that prices rise first, and make it necessary that more money be issued in order that business may be carried on at the new level. Thus, it was claimed, higher prices cause more money to be placed in circulation. This whole dispute may well pass by default. The modern view would be that M and P interact upon each other, and that both, in common, influence and are influenced by outside factors, such as changes in harvests, inventions, trade, government fiscal policy, international economic relations, psychological variations of optimism and pessimism, velocity of circulation, and many other processes. The give and take of all these elements is of primary importance. The interconnections, the reciprocal relations, the mutual influences, are the facts of greatest significance. M and P are simply two variables in a complex group of variables. An initial disturbance anywhere will set in motion disturbances all along the line and these in turn will react upon the initial disturbance. Thus, prices are looked upon as a function of a group of variables, and not as an effect of one variable alone, M. The

task of monetary economics is to ascertain the interrelations of these factors under different types of fluctuation, and to chart the shifting sequences and amplitudes of change from phase to phase of inflation and deflation.

(4) The quantity theory is criticised on the ground that *prices cannot be caused by money because they are fixed in advance of the exchange of money for goods.* "The offer of a certain amount of a medium of exchange for goods merely records the result of the antecedent price-making process. . . . The quantity of money used as the actual media of exchange no more determines price than the entries of deeds and conveyances in the county records determine the prices of the land whose sale is stated in the papers recorded. The circulating medium is not a cause of prices; it is only a convenient means of exchanging goods after the price has been already fixed."[1] This attack upon the quantity theory is not convincing, largely because it brushes aside the factor of the money-spending power of the buyer as an influence in deciding how much he will pay and how much he will buy at the given price. Even though exchange-value ratios are subjectively fixed before money actually changes hands, surely the ability to spend money more profusely because of an addition to the number of money units in one's stock of ready purchasing power tends to bid up the price of goods. Hence, if the price-making process is antecedent to the actual exchange of money for goods, so the money-spending power of the community is antecedent to the price-making process. Here as in most other cases of economic reasoning, the dispute over which comes first and which comes last hinges largely upon the point in the circle at which we start.

(5) The quantity theory is criticised on the ground that *it admits credit and other substitutes for money as factors determining the value of money itself.* What to do with credit and currency has always been a puzzle to the quantity theorist. One group held the view that credit and currency affect the value of money by lessening the demand for money. They contended that as people become willing to use these substitutes for money, they lessen the requirement for money itself. According to such a view, credit and currency can affect the value of money only in so far as they alter the demand for money, *i.e.*, gold. This doc-

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[1] LAUGHLIN, J. LAURENCE, *The Principles of Money*, 1903, pp. 316, 317, 358.

trine has proved to be quite unsatisfactory, and most quantity theorists now would probably concede that credit and currency can affect prices directly through their influence upon the country's stock of ready purchasing power as well as indirectly through their influence upon the use of gold money. This direct influence is implicit in the equation $MV + M'V' = PT$. The factors M' and V' include the volume and velocity of bank deposits and are presumed to measure the importance of credit in determining the price level. The factors M and V include volume and velocity of currency as well as of gold coin. Moreover, according to the view of Irving Fisher, the ratio of M to M' tends to be fairly constant, except during transition periods. All of these tenets of a quantity doctrine are challenged by the critics. "A wide distinction exists between the standard in which prices of goods are expressed and the media of exchange by which the goods are actually transferred. . . . Some forms of money serve only as media of exchange and *have no influence whatever on price*. . . . The refined system of barter created by modern banking has no more effect on the normal prices of goods as expressed in the standard metal than primitive barter had."[1] This viewpoint treats credit as nothing more than pure barter. Credit, it is said, facilitates exchanges, but only at ratios or prices predetermined solely by the forces working upon standard money. It denies that credit and paper currency can have any influence whatever upon the value of the monetary unit. Such an extreme view appears to be much too narrow to fit modern conditions. An adequate view considers that all forms of purchasing power go into the same hopper, namely, the country's stock of ready command over goods. Gold, currency, credit, each plays a somewhat distinct part in the structure of the whole system, but in so far as each in its own way and all in their entirety modify the proportion of the country's income which is held in the form of ready purchasing power, the price level and the value of money will be modified. Thus, by modernizing the framework of the quantity theory, a believer in that doctrine can make it less vulnerable to attack.

(6) The quantity theory is criticised on the ground that *it does not truthfully portray the manner in which the money commodity is matched against the sum total of other commodities*

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[1] Laughlin, *op. cit.*, p. 320.

The criticism here is aimed at the doctrine of Mill: "The whole of the goods being in any case exchanged for the whole of the money which comes into the market to be laid out, they will sell for less or more of it, exactly according as less or more is brought."[1] Undeniably, this notion is crude and clumsy. The point by Laughlin is well taken, "No average of the prices of a number of commodities can be derived in any other possible way than by combining the actual quotations of single commodities. A level of prices can come into existence by no other conceivable process."[2] This notion of the value of money as being the sum or composite of a great number of particular values of individual goods in terms of money is a marked advance over the unreal notion that somehow goods *en masse* are matched against money *en masse* and an exchange ratio or price level arrived at thereby.

In the hands of the anti-quantity school, this emphasis upon particular values of individual goods is made the basis for a commodity theory of the value of money. According to such a theory, gold is looked upon as a commodity like any other commodity. If the supply of gold were to be increased from any cause, it would probably first pour into the vaults of the banks, and there as much of it would be used as reserves or coin as the needs of trade might require. The community and the banks would use as much as needed for money, and only that much. The surplus would be diverted to the industrial arts. "If it finally went into the arts, the increased supply must there adjust itself to the existing demand in exactly the same way as would that of any other commodity."[3] If metal formerly priced at $10 and exchanging for 10 bushels of wheat were now depressed in value so that it would exchange for only 8 bushels of wheat, the new ratio of gold to wheat would be expressed by quoting the new price of wheat at $1.25 per bushel. By similar direct comparisons between gold and steel, cotton, copper, corn and countless other articles, individual exchange ratios would be built up between gold and goods. A change in the value of the standard money would thus have taken place, due to the supply and demand of the commodity as such. In the process the value of the gold in money and the arts would strike an approximate equilibrium. Gold would pour into the arts until its marginal utility was the same there as in monetary usage. The metal would redistribute itself as between money and the arts whenever this equilibrium was disturbed.

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[1] *Principles of Political Economy*, book III, ch. VIII, p. 2.

[2] LAUGHLIN, *op. cit.*, p. 352.

[3] *Ibid.*, p. 339.

The insistence upon these finespun distinctions by the critics of the quantity theory probably has been a good antidote to the excesses of some quantity theorists; but in ultimate analysis one gains the impression that the distinctions largely rest upon verbal definitions and labels rather than upon real differences. The commodity theorists admit the *supply* of money as one important factor in determining its value. The quantity theorists admit the *demand* for money as one important factor in determining its value. The emphasis is placed a little differently by the two approaches, but the underlying processes of valuation are fundamentally the same. To one who reads the literature of discussion in this field, the impression is given that often there is no real issue at stake. A phrase possible of more than one construction is often given that construction which best suits the mind of the critic. A partial statement abstracted from its context is found vulnerable to attack when the context as a whole might be unobjectionable. If one probes beneath the differences of definition and phraseology, one is likely to reach a viewpoint which was admirably stated by Alfred Marshall in 1899, "I hold that prices vary directly with the volume of currency, if other things are equal; but other things are constantly changing. This so-called 'quantity theory of the value of money' . . . has been the cause of much controversy; but it has never been seriously denied by anyone who has taken it as a whole, and has not stopped short, omitting the words, 'other things being equal.'"[1]

The room for misunderstanding is narrowed if the mechanism through which money and price adjustments take place is analyzed. A knowledge of the basic processes involved not only shows the crudity of the old notion that somehow all the goods are matched against all the money, but also reveals the narrowness of the strict commodity view in its assertion that credit and currency are mere barter and can have no influence upon the price level. The following section contains a brief outline of the mechanism through which money and credit relate themselves to the general movement of prices.

The Mechanism of Adjustment between Money, Credit and Prices.—Let us assume that an initial disturbance occurs in the form of an addition to the gold supply of the United States. By what processes may this increased quantity of standard money eventually bring about a rise of prices? The processes will depend to some extent upon the particular phase of the business cycle in which the country finds itself at the time. For convenience, we may confine attention to the processes as they might appear if the new gold arrived in the late stages of a period of business depression. The gold would come into the hands of the member banks and by them would be deposited in the Federal Reserve Banks. The new deposits of gold might have any of several different effects upon the legal reserves of the member banks. If member banks were at the time abnormally indebted to the Federal Reserve Banks on account of rediscounts, they would probably pay off such indebtedness, thereby substituting gold for borrowed reserves but not gaining any net addition to reserves. If the member banks were fairly free of debt, and the Federal Reserve Banks feared that speculative use of funds loomed ahead, they might sell United States securities in the open market and so draw out of the market a sum of money equal to the new gold acquired. In this event, there would be no net addition to the legal reserves of the member banks. Both of the foregoing assumptions are possibilities, but they are not likely to occur at the late depression stage of the business cycle. At such a time, rediscounts are likely to be at a minimum, speculation moderate, and the Federal Reserve Banks favorable toward a revival of business activity. If these probable conditions prevail, the new gold will constitute a net addition to the legal reserves of the member banks. These banks will endeavor to build up loans and deposits on the new reserves, because that is the only method by which they can convert idle gold into earning assets. In order to create the new credit, the banks will stimulate borrowing by lowering short-term interest rates. Low rates will stimulate speculation in the stock market and other speculative markets, and the funds will pass into the hands of the construction industries, into the payrolls of their employees, and ultimately into the general consumer markets of the country. Low rates will also stimulate commercial borrowing, and, if general business conditions are favorable, will result in expansion of loans and deposits of commercial borrowers. In case these responses are slow in developing, the banks may for a time invest the surplus funds directly in bonds, and by so doing stimulate rising prices and greater optimism in the bond market. As business revival accumulates, traders become optimistic about the future, the prospect of profits becomes enticing, the new funds created against the new gold reserves augment the money-spending power of important classes in the community. Anticipating an upswing of prices characteristic of periods of prosperity, such classes will make heavy outlays for materials at present prices in order to avoid paying tomorrow's higher prices. This increased purchasing pressure for goods will bid the prices of goods up and will induce a general upswing of commodity prices.

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[1] *Official Papers*, edited in 1926, p. 267.

As prices advance and volume of business expands more cash will be required for payrolls and for retail trade. This development will drain cash, chiefly in the form of notes, out of the banks and into circulation. The banks will have to replenish their vault cash by calling upon the Federal Reserve Banks for new currency. To this end, member bank rediscounts will increase. At this stage, the full effects of the new gold will be apparent in higher commodity prices, in expanded loans and deposits, in enhanced currency requirements, and in falling reserve ratios. But it would be going altogether too far to claim that higher prices were directly caused by the lone factor, a new supply of gold. The conditioning factors are of fundamental importance: the phase of the business cycle, the policy of the central banks, the tone of the stock market, the level of interest rates, the expansion of deposits and later of currency, the optimism and confidence of business, the expectation of rising profits and rising prices. If these conditioning factors were not favorable to business revival and bank expansion, the new gold might fail to exert any appreciable influence upon prices. The complex group of processes must be taken in their entirety and the movements of gold, currency, credit and business must be traced with a view to discovering their interconnections and their mechanism of adjustment.

The mechanism of contraction of currency and credit may be compared with that of expansion. After business prosperity has reached an advanced stage and prices have risen to a high point in the business cycle, the aggregate volume of credit and currency which has been required to finance the boom encounters certain limitations. The expansion of bank deposits causes reserve ratios to fall toward that minimum point of safety which is fixed either by law or by custom. Moreover, the expansion of bank deposits is accompanied by a drain of cash out of the banks and into the hands of the public. Under the Federal Reserve system this drain is for a time met by paying out idle vault cash already in the possession of the member banks. But as the currency requirement persists, the member banks are forced to turn to the Federal Reserve Banks for additional issues of currency. Let us assume that these issues take the form of Federal Reserve notes. Such notes will impose a double strain upon the banking system. First, they will impose a strain upon the member banks because, in order to obtain a million dollars of new notes, member banks will have to increase rediscounts at the Federal Reserve Banks by a million dollars.[1] If they were expanding merely demand deposits against which legal reserves of, let us say, ten per cent are required on the average, they would need to add to rediscounts only by the amount of $100,000. But if they were expanding Federal Reserve notes, they would add $1,000,000 to rediscounts in order to obtain $1,000,000 new notes. That is to say, when the expansion reaches the stage where cash is required in circulation, the member banks must rediscount about ten times as heavily in order to support a given volume of expansion. A second form of strain is one which affects the reserve ratios of the Federal Reserve Banks. If member banks add a million dollars of Federal Reserve notes to circulation, the Federal Reserve Bank must at a minimum set aside forty per cent, or $400,000, as gold reserve. If, however, member banks expand demand deposits a million dollars, against which legal reserves of about ten per cent, or $100,000, must be required, the Federal Reserve Bank is in turn obligated to set up a reserve equal to thirty-five per cent of $100,000, or $35,000. In one case, $400,000 of Federal Reserve gold is used up, whereas in the other case only $35,000 is used up. Obviously the reduction of reserve ratios of the Federal Reserve system is more than ten times as great when expansion takes the form of note issues as when it takes the form of demand deposits.

These developments give rise to caution and apprehension among the bankers, and lead to advances in interest rates, to more conservative accommodation of borrowers, and to pressure for repayment of outstanding loans of inferior quality. The strain which is accumulated from within is likely to be accentuated by an international strain. During the boom, rising prices are likely to stimulate heavy imports and an adverse balance of trade, and so to induce an outflow of specie. This external drain of gold cuts down the reserves of the banks and hastens the date when reserve ratios approach the danger point. As soon as the tension of credit and reserves is sensed by the business community, there arises a general anticipation of falling prices. Then people who have been accumulating large stores of goods rush into the commodity markets to dispose of the goods before prices actually fall. But such heavy selling itself intensifies the fall of prices and precipitates a general decline such as is characteristic of most periods of crisis and depression. As prices fall, less currency is needed. Redundant notes flow out of circulation and accumulate in the banks, where they may in part be retired and in part held as idle surplus cash until the next expansion period. This brief summary of the mechanism of contraction suggests the general processes which appear in the major short-term deflations of the price level.

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[1] We may assume that net imports of gold are not being received at the time.

In this mechanism, it should be noted that the central bank acts as a kind of buffer against sudden changes in prices on account of foreign gold movements. In this respect, central banks of most European countries fulfill a function fundamentally similar to that of the Federal Reserve Banks. As a matter of historical development, the American system was largely drafted according to the European model. Under this system, gold reserves are concentrated in the central bank. Usually the amount of this gold reserve is well above the minimum required by law or custom. Gold can in some measure be released from this central reservoir without an appreciable influence upon credit and prices. Likewise, gold can be added to the reservoir without appreciable influence upon credit and prices. Minor fluctuations of the central reserve need have no material consequences for inflation or deflation. The reserve ratio has a certain flexibility which enables the central bank to act as a kind of financial shock-absorber against sudden gains or losses of specie. Of course, if the drain or accumulation of gold is persistent, the situation may be communicated to the general state of credit and prices by changes in discount rates, fall or rise of loans and deposits, and speculative booms and crashes. Even under such extreme conditions, however, the central banks normally exert a stabilizing and steadying influence upon the general financial and industrial mechanism.

The banks of any one country have many important characteristics unlike those of the banks of other countries. The banking systems of all countries experience changes arising from modifications of both law and custom. The mechanism of adjustment of money and prices is a changing, evolving, growing institution. The similarities and differences from country to country and from period to period are of utmost significance. The foregoing case discussed for purposes of illustration assumes the Federal Reserve system to be in operation and to be following criteria of control as of 1927. If we were to trace the mechanism by which gold influenced prices under the old National Bank Act, we should find far-reaching differences.[1] Even if we were to study early stages of Federal Reserve processes in comparison with later stages, we should find important differences. If we make a comparison between the American and the English systems, we find important differences. Hence, universal generalizations about how gold will affect prices need to be made with considerable caution, and with regard to historical and geographical uniformities and differences.[2]

Having observed the mechanism of adjustment between monetary supply and demand, we may proceed to a statement of the fundamental character of the fluctuations of supply and demand which take place through this mechanism.

The Variability of Demand and Supply of Money.—Let us assume a purely hypothetical situation in which a community receives a constant income, i, measured in terms of the physical volume of goods produced and consumed. Let us further assume that the community desires to keep on hand in the form of ready purchasing power a sum sufficient to command one-tenth of its income. Then its demand for money may be said to equal $1/10 \times i$. We may call this its demand for *real* purchasing power. The word real is important, because no matter what happens to the number of dollars available, the *real* purchasing power of the aggregate stock of dollars will remain constant, *i.e.,* will be equal to 1/10 × i. Now let us suppose that over against a fixed demand for *real* purchasing power, we introduce a variable supply of money units. This variable supply must be so equated to a constant demand for total purchasing power that the number of money units times the purchasing power per unit will command one-tenth of the physical production and consumption of the community. Substituting symbols, we may say $Q \times V = K$, where

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[1] See YOUNG, ALLYN A., *Review of Economic Statistics*, Harvard University, vol. VII, 1925, p. 33; also, see SPRAGUE, O. M. W., "The Distribution of Money Between the Banks and the People Since 1893," *Quarterly Journal of Economics*, vol. XVIII, 1904, pp. 513-528.

[2] A brief comparison of the monetary mechanisms of various countries is available in TAUSSIG, F. W., *International Trade*, 1927, ch. XVII.

Q is the number of money units
V is the value or purchasing power of each unit
K is the constant *real* purchasing power of the *aggregate* stock of money, *i.e.,* 1/10 × i.

To illustrate, if a community having a money stock of $1,000,000,000 when the purchasing power per unit is 100, raises the total stock to $2,000,000,000, and the index of purchasing power falls to 50, the product, $Q \times V$, will remain unchanged. If Q increases to $1,500,000,000 and V declines to 66 2/3, the same constant product is maintained. Thus, by a flexible shifting of the purchasing power per unit, a constant aggregate real purchasing power can be preserved, even though the number of money units be variable.[1]

The hypothetical situation above outlined may now be compared with certain types of conditions which appear in real experience. A community falls into the habit of relying upon a certain stock of real purchasing power in money form. Custom and convenience set up a certain normal requirement. The requirement will increase somewhat from year to year in accord with growth in the country's real income. It will differ somewhat from phase to phase of the business cycle. It will even differ somewhat from one season of the year to another. But at any given period, the public will require a certain sum of real purchasing power, no more and no less. If, in the midst of this situation, new gold is discovered and new currency and credit are created by the banks, the new quantity of money will be absorbed by the public. More units of money will be in their bank balances and in their pockets. But if there are no more goods to be bought with the money, if the work required of money is no greater, then the money unit will depreciate in purchasing power until the total stock of real purchasing power is what the public intended to keep in that form in the first place. An increase in the quantity of units does not give rise to any increase in the total work done by money or in the proportion of their real incomes which people desire to hold in money form. The demand for *real* purchasing power being what it is, changes in the quantity of units of money will not disturb it. The aggregate real value of the money stock remains substantially what it would have been anyway, regardless of the number of units injected into circulation.

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[1] To the reader who thinks in terms of supply and demand curves and of elasticity of demand, these relations will be familiar under the head of a *constant outlay curve*, where the *elasticity of demand is unity.* See MARSHALL, ALFRED, *Money, Credit and Commerce*, 1924, pp. 47–50, and Appendix C; also MARSHALL, *Principles of Economics*, book III, ch. IV.

A repetition of this doctrine in somewhat different terms may add to its clarity. The doctrine reduces to the simple proposition that, given a certain requirement on the part of the community for a ready money command over goods and services, an increase in the number of dollars, pounds, francs or marks will tend to be offset by a *proportionate decrease* in the purchasing power per unit.

Suppose that instead of assuming a fixed aggregate demand and a variable supply of units, we assume a fixed supply of units and a variable aggregate demand. The proposition then becomes as follows: Given a constant number of money units, an increase in demand for stocks of real purchasing power would lead to a *proportionate increase* in the purchasing power of each unit.

Although these assumptions of either absolutely fixed supply or absolutely fixed demand are to some extent arbitrary and untrue to life, nevertheless they help to sharpen the conceptual devices necessary for reflection on monetary problems. However, in order to escape from arbitrary assumptions, let us take a case where both supply and demand are highly variable. The terms of the case are fulfilled, for instance, during a period of inconvertible paper money issued in extremely large quantities. People discover that each wave of new notes issued plays havoc with their stocks of real purchasing power. They anticipate further waves of issue and further depreciation of the purchasing power per unit. Knowing that the value of their money will be less tomorrow than it is today, they will wish to get rid of it before the loss of value occurs. The only way of avoiding loss is to spend money immediately it is received. Consequently, every one seeks to reduce his aggregate stock of *real* purchasing power. Whereas formerly people, let us say, kept one-tenth of their real income in the form of real purchasing power, now they find it advantageous to keep only one-twentieth or even one-hundredth. In essence, they are reducing their demand for money in order to forestall the expected future depreciation of money.

Let us assume that in 1923, a German worker received annual wages of 100,000,000 marks. In 1913 he had received only 10,000 marks. Obviously, in 1923 he actually received 10,000 times as much payroll as formerly. But this does not mean that his demand for marks has increased ten thousand times. Quite the contrary is true. He now spends his pay envelope the instant he receives it and so keeps on hand in the form of real purchasing power a very small fraction of his income. His demand for a stock of real purchasing power has sharply decreased.

At this stage of depreciation, we find an acute case of increasing supply and decreasing demand. To use the terminology previously defined, V falls much faster than Q rises, and $Q \times V$ is not a constant stock of real purchasing power. To state the matter in terms of proportionality, an increase in the quantity of money is followed by a *more than proportionate decrease* in the purchasing power per unit.

This phenomenon may be roughly estimated in the case of Germany by the following method. In 1913, Germany kept in the form of currency an average stock of purchasing power which was equivalent to about 1,500,000,000 gold dollars. In the years of extreme inflation, 1921-1923, the inconvertible paper marks can be adjusted to a gold basis by dividing the quantity of such notes by the current exchange rate on a gold standard country. In this instance, since the United States was the exceptional example of a country still on a gold basis, we may adopt the dollar rate of exchange as the basis for adjusting paper marks to their gold value. The shrinkage in the gold value of German paper marks is then indicated by the following index numbers:

TABLE I

Year	Estimated Gold Dollar Value of German Currency (Index Numbers)
1913	100.
1920 (December)	63.
1922 (December)	40.
1923 (October 31st)	1.2

Obviously the stock of ready purchasing power in the form of domestic currency was approaching zero in 1923. This collapse was a rough and approximate measure of the decline in demand for money under the strain of inflation.[1]

The illustration is abnormal, but after all it merely shows under a magnifying glass processes which prevail in moderate form under normal conditions. From depression to prosperity, from month to month, from decade to decade, the demand for money, *i.e.,* for stocks of ready purchasing power, undergoes change and modification. Consequently, an increased supply of money will rarely if ever lead to an exactly proportional decreased value per unit, and an increased demand will rarely if ever lead to an exactly proportional increased value per unit. Constant readjustment is required between fluctuating supply of units, aggregate stocks of real purchasing power, and value per unit.

On some terms, the money supply will be equated to the money demand. The money units, be they more or less, will do the amount of money work required,—no more and no less. Stock of money units and stock of real purchasing power will be held in balance by modification of the purchasing power per unit.

These readjustments can best be studied by reducing them to standard time series,—secular, cyclical, seasonal and irregular types of fluctuation. The types of fluctuation will be found to apply differently to various elements of the money structure, depending upon whether the element under survey is gold, paper currency, or bank deposits.

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[1] For further data and discussion, see Keynes, J. M., *Monetary Reform,* 1923, ch. II; Cannan, Edwin, *Economic Journal,* vol. XXXI, pp. 457–461; Lehfeldt, R. A., *Economic Journal,* vol. XXXII, pp. 557–560; League of Nations, *Memorandum on Currency and Central Banks,* 1913–1924, vol. I, p. 25.

Types of Fluctuation of Demand and Supply of Money.—The following chapters (X-XX) contain a discussion of the main types of price fluctuations,—secular, cyclical, irregular. The secular or long-time movement involves chiefly a discussion of the supply and demand of gold. The cyclical or short-time movement involves a discussion of the business cycle. The irregular or fortuitous movement involves a discussion of the inflation and deflation associated with certain major wars.

This approach to the study of price movements represents an attempt to resolve the difficulties of the quantity theory dispute by building up a positive account of price movements and of the major adjustments of monetary supply and demand related thereto. Such an attempt does not involve any effort to prove or disprove the quantity theory. The writer is not desirous of adding to the already super-abundant controversial literature on the quantity theory. On the other hand, he is desirous of setting up a constructive analysis of price movements and of monetary value theory.

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Chapter X

GOLD PRODUCTION AND PRICES

Nature of the Problem.—A glance at the accompanying chart shows that, for a century and a half, prices have been subject to long-time swings upward and downward. If the chart could be carried back several centuries further, similar long-time movements would appear. This phenomenon presents a problem of a special type, a problem of prolonged changes in the purchasing power of money in specie-using countries. Are these changes explainable by the quantity theory or by some other theory? Are nations today undergoing the same kind of fluctuation? Is there a prospect of a steady rise or fall of prices during the decades of the near future? Questions of this character are of great practical, as well as theoretical, interest.[1]

The Early History of the Precious Metals.—The precious metals were prized as articles of ornament by the peoples of Egypt and of Asia Minor as early as 4000 B. C. However, the first known use of the precious metals as money occurred in Egypt between 3000 and 2500 B. C. At that period, a large amount of trade was still transacted in barter; but certain transactions, presumably those involving large amounts, were effected by means of gold and copper in rings of a fixed weight. Owing to the fact that silver was very scarce and probably four or five times as valuable as gold, the ring currency was primarily limited to gold and copper. In Babylonia prior to 2000 B. C., silver was being cut up into small lumps and stamped with the emblem of royalty. Prices were quoted by weight of these lumps of precious metal. Coins were not yet in use, but money was loaned by weight and interest charged at rates ranging in the neighborhood of 18 to 20 per cent per annum. Gold was from 13 to 15 times as valuable as silver.

Actual coinage first appeared during about the seventh century

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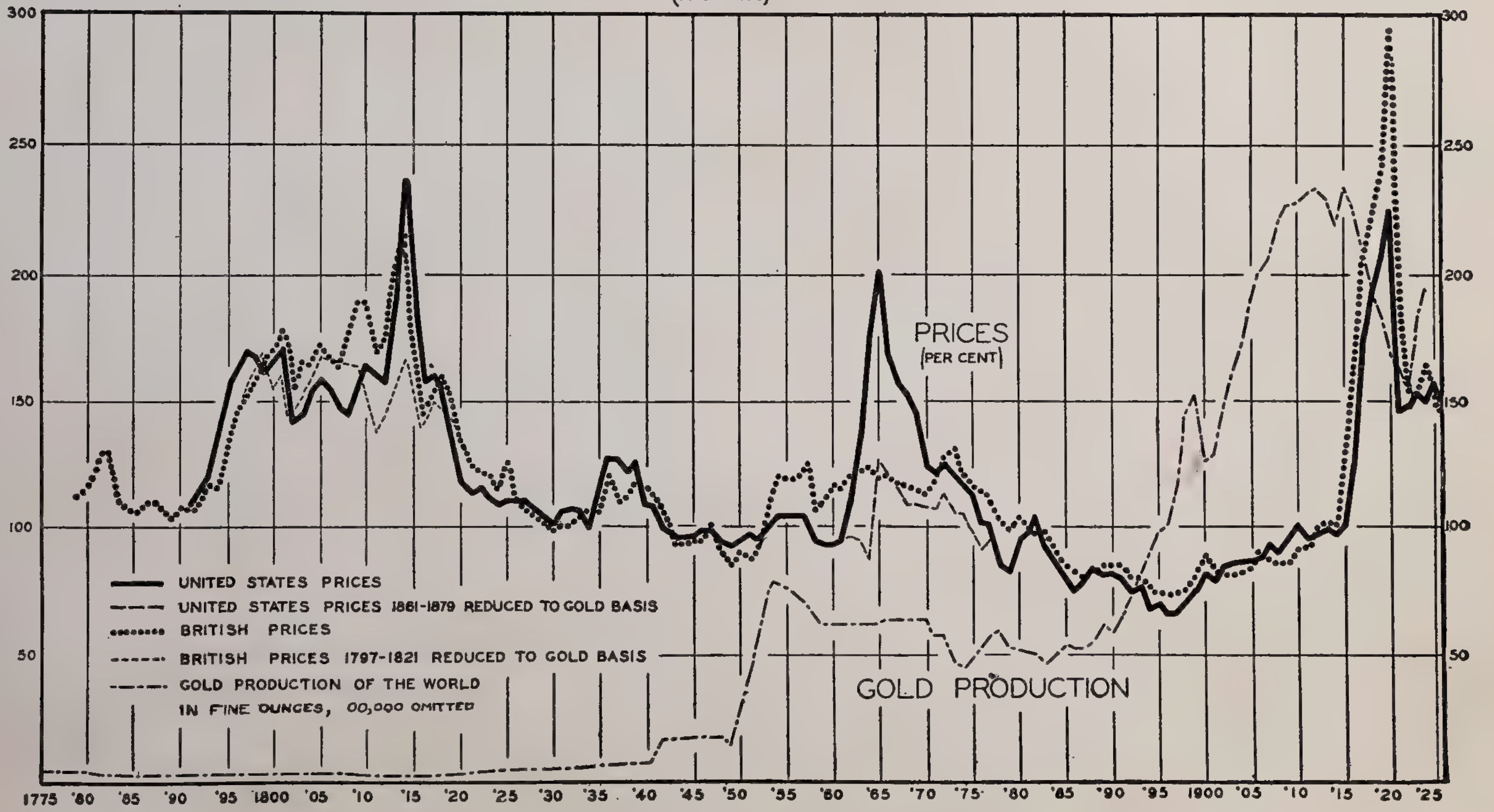
[1] Much of the material in Chapters X to XIII has been adapted from a monograph by the writer on *Gold Production and Prices Before and After the World War*, published as Indiana University Studies, 1928.

The writer is indebted to the Indiana University Bureau of Publications for permission to reprint portions of the monograph.

CHART NO. 8

WHOLESALE PRICES AND GOLD PRODUCTION 1779-1926*

(1913 = 100)



B. C. Among the Greeks, silver was the principal metal coined. The convenience of coinage caused the device to spread to Persia and other parts of the Orient. The expression, "Money makes the man," is attributed to Solon in the sixth century B. C. The entire price scale was, of course, much below that of recent centuries. For instance, the equivalent of thirty-five to forty dollars was ample for food for a well-to-do family in Greece for a whole year. However, fluctuations in the cost of living as great as those occurring in England and the United States during the recent World War occurred both in Greece and in Rome. These fluctuations were traceable primarily to the degree to which the precious metals became scarce or plentiful from time to time.

The Romans borrowed coinage from the Greeks. At first copper was used, but by 268 B. C. silver was adopted. Formerly the Romans had paid their debts in commodity media of exchange, particularly in cattle; and when coinage was adopted, they stamped the figure of the ox on the coin as a reminder of the article which had long facilitated their trade.

Throughout the ancient period, the production of gold and silver was carried on chiefly by slave or convict labor. The mines were operated by direction of autocratic governments, and the ruthless coercion of slaves in the mines under conditions of extreme cruelty is a black story on the page of history. Moreover, the amount of the precious metals possessed by a nation was commonly due not to the nation's efficiency in production, but to its military prowess in plundering the treasure of neighboring peoples. The military commanders in Egypt, Persia, Greece, and Rome considered one of the greatest proofs of their triumph to be the amount of tribute and spoil which they brought back from conquered countries. In brief, the quantity of specie was due not to the operation of laws of supply and demand under a state of free competition, but rather to the operation of slavery, ruthless military seizure, and pillage. The treasure thus obtained not only furnished a supply of currency, but also furnished a great amount of gold and silver for ostentatious ornament and religious ritual.

At the height of its power, the Roman Empire probably possessed the equivalent of more than $1,500,000,000 of specie; but after the barbarian invasions, this sum was for the most part destroyed, and by 800 A. D. probably not more than $150,000,000 was still in existence. Following the break-up of the Roman Empire, and during the Middle Ages, very little money of any kind was in use. Where money was used at all, it ordinarily consisted of silver. Such slight production of the precious metals as took place was barely sufficient to offset abrasion and wastage of the old supply.

At the time of the discovery of America, the amount of money in Europe was only a little more than $200,000,000. Scarcity of specie was acute, and one of the strongest incentives to exploration and discovery during the Elizabethan age was the search for gold and silver. Wherever the explorers came in contact with the New World, one of the most insistent questions asked of the natives was where gold and silver might be obtained. Important discoveries of the precious metals were made chiefly in Central and South America. In 1545, the rich Potosi silver mines in Peru were discovered. During the three centuries following the discovery of America, nearly $11,000,000,000 of new silver and $4,500,000,000 of new gold were produced. Although estimates of production during this period are, at best, very loose approximations, the following estimates give some indication of the trend.[1]

TABLE I

ESTIMATES OF ANNUAL AVERAGE OF GOLD AND SILVER PRODUCTION

Period	Gold Production, Annual Average	Silver Production, Annual Average
1493–1600	$6,760,000	$18,580,000
1601–1700	9,990,000	33,190,000
1701–1800	27,820,000	56,060,000

It is obvious that during the three centuries following the discovery of America, the annual average output of the precious metals increased three to four times. The effect of this increasing quantity of specie was a marked increase in the general level of commodity prices.

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[1] MAGEE, J. D., "The World's Production of Gold and Silver from 1493 to 1905," *Journal of Political Economy*, vol. XVIII, 1910, pp. 50–58.

Adam Smith devoted intensive study to the relations between specie and prices during the three centuries following the discovery of America, and his interesting observations may here be noted:

> The discoveries of the mines of America diminished the value of gold and silver in Europe. The discovery of the abundant mines of America seems to have been the sole cause of this diminution in the value of silver in proportion to that of corn. It is accounted for accordingly in the same manner by everybody; and there never has been any dispute either about the fact or about the cause of it. The greater part of Europe was, during this period, advancing in industry and improvement, and the demand for silver must consequently have been increasing. But the increase of the supply had, it seems, so far exceeded that of the demand, that the value of that metal sank considerably. The discovery of the mines of America, it is to be observed, does not seem to have had any very sensible effect upon the prices of things in England till after 1570, though even the mines of Potosi had been discovered more than twenty years before.[1]

Although Adam Smith noticed that after 1640 there was still a "gradually increasing price of many parts of the rude produce of land," he attributed such price increases to individual factors of supply and demand for the goods, and said that "between 1630 and 1640, or about 1636, the effect of the discovery of the mines of America in reducing the value of silver appears to have been completed." [2]

During this period, indexes for measurement of the price level are very incomplete. Many estimates place the increase of the price level between the years 1500 and 1800 at about 500 per cent, but more conservative estimates place it at 200 per cent. The following indexes of the price level are suggested by Irving Fisher as approximately accurate:[3]

PRICE INDEXES

1500–1800

Year	*Index*
1500	100
1600	214
1700	257
1800	285

[1] *Wealth of Nations,* book I, ch. XI, part 3.

[2] *Ibid.*

[3] *The Purchasing Power of Money,* 1911, p. 237.

Although specie was increasing in volume, population and trade were also increasing; and the latter factors tended to offset somewhat the inflationary effect of the new money supply. From a per capita stock of money in 1500 amounting to less than $4.00, there was an increase bringing the per capita stock up to about $12.00 by the middle of the eighteenth century.[1]

The effect of the new money supply was very unequal in different parts of Europe. As pointed out by Cliffe Leslie:

> There was no even distribution through Christendom of the treasure which the Spaniards tore from the New World; and on this and other accounts prices rose unequally in different places, and not at all in some. In the chief towns of Spain they seem to have risen even before the fifteenth century had closed; and in the Netherlands their ascent was much earlier than in England, where the state of the currency before 1560, and the drain consequent on its debasement, together with the foreign expenditure of the Government, both retarded and concealed the first symptoms of the falling value of the precious metals.[2]

Throughout this entire period, the factors governing the supply of money were far different from those prevailing under a normal condition of free enterprise. The natives in America were often forced into slavery in order to operate mines. European explorers took by plunder whatever precious metal they could get. Accident and luck played a large part in determination of the supply of new specie. But whatever the forces governing the rate of production, the effect of that production upon prices was unmistakable. The rapid influx of new metal caused a substantial increase in the price level of the times.

Rising Prices, 1782-1814.—The movement of wholesale commodity prices in Great Britain and the United States from 1782 to 1820 is shown by the chart on page 214. Both countries experienced a low point of the price level centering about the year 1790, and a rise during the succeeding twenty-five years of approximately 100 per cent.[3]

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[1] See Del Mar, Alexander, *History of the Precious Metals*, 1880, p. 203.

[2] *Essays in Political and Moral Philosophy*, 1879, p. 265.

[3] Supplementary evidence is found in indexes of wages and the cost of living. The cost of living rose 87 per cent (1790–1813) in Great Britain, according to Silberling's estimate, and 76 per cent (1790–1810), according to Wood's estimate. See Harvard University, *Review of Economic Statistics*, 1923, p. 235, and *Economic Journal*, Dec. 1899, p. 588. The latter source estimates the increase of industrial

An important influence in this inflationary movement was the expansion of the total medium of exchange. This expansion was not occasioned by increased gold production, since the average annual world output of that metal probably declined slightly during the first quarter of the nineteenth century. Such gold as existed in the United States was exported, because with a market ratio above the bimetallic mint ratio of 15 to 1, gold was the dearer metal and, according to Gresham's law, was driven out of circulation and out of the country. Coin in circulation was almost exclusively silver.

The expansion of currency was partly occasioned by increased silver production. From 1780 to 1810 the annual average world output of silver was valued at about $38,000,000, an amount which represented an increase of about one-third over the silver output of preceding years. In so far as this increase of silver production affected the United States, it was merely sufficient to meet the needs of that country's rapidly growing population. Indeed, the per capita stock of coin in both England and the United States probably remained stationary or even declined slightly during the period.[1]

Doubtless the chief cause of expansion of the medium of exchange was not the production of either gold or silver, but the growth of bank notes and credit in Great Britain and the United States. The charter of the first Bank of the United States ran from 1791 to 1811. In 1811, there were 88 state banks placing their notes in circulation. The growth of note circulation has been estimated as follows:[2]

TOTAL NOTE CIRCULATION

STATE BANKS AND NATIONAL BANK

1784	$2,000,000
1811	28,000,000

When coins and notes are combined, and compared with population growth, they show a 100-per-cent increase in currency per capita. The rise is from $4.00 per capita in 1784 to $8.00 in 1811.

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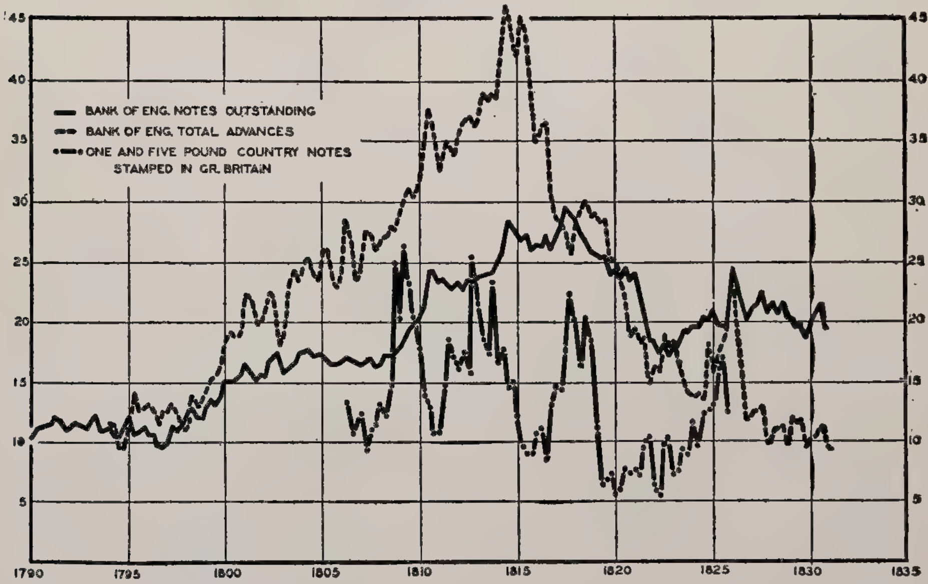
wages at 70 per cent (1790–1810), and Bowley estimates the increase of agricultural wages (1790–1814) at 94 per cent. See *Journal of the Royal Statistical Society*, vol. LXII, September, 1899.

[1] DEL MAR, A., *History of the Precious Metals*, 1880, pp. 210–214.

[2] HEPBURN, A. B., *History of Currency in the United States*, 1924, p. 87.

The War of 1812 introduced abnormal inflationary factors. From 1811 to 1815, state banks multiplied in number and expanded their note circulation from $23,000,000 to $110,000,000. The majority of banks, except in New England, suspended specie payments in August, 1814, and their notes were quoted at a discount. Specie payments were not resumed until 1817. About $37,000,000 of "Treasury Notes" were issued by Congress and were circulated widely. Under the pressure of excessive quantities of note circulation, the price level yielded to inflation and the value of the dollar suffered sharp depreciation.

CHART NO. 9
BANK NOTES AND CREDIT IN ENGLAND (1790-1831)
(MILLIONS OF POUNDS)



In Great Britain, as in the United States, the main factor in inflation appears to have been an increase of bank currency rather than an increase of coin. Under the stress of war financing, specie payments at the Bank of England were suspended in 1797, and the medium of exchange was based upon inconvertible paper until 1821. Gold was quoted at a premium in terms of paper during this period. The chart on page 214 shows the trend of commodity prices after adjustment for the premium on gold.[1]

The great importance of fluctuations in bank currency and credit in England is indicated by the accompanying chart. The rapid growth of country banks, from 400 in 1802 to 940 in 1814, led to large issues of inconvertible notes. In appraising the effect of these issues, N. J. Silberling declares:

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[1] According to data computed by N. J. SILBERLING, *Review of Economic Statistics*, 1923, pp. 255, 258.

> The probability seems warranted that it was the vast, almost wholly unregulated, flood of inconvertible country-bank credit which mainly caused the inflation, or at any rate greatly facilitated the successive "booms" of the war years; while the severe price reactions both produced, and were in turn intensified by, heavy country-bank failures.[1]

The notes and discounts of the Bank of England *followed* rather than *preceded* the major fluctuations of prices. This lag does not of course deny that the central bank's expansion was an accompanying and contributing cause of inflation, but it suggests that probably the initiating cause was the expansion by provincial banks. Since expansion rested in any case upon inconvertible promises to pay specie, the existence of gold and silver reserves was a very remote and ineffectual check upon inflationary tendencies.

Falling Prices, 1814-1850.—From the end of the War of 1812 until about 1850 the trend of prices was irregularly downward.[2] A great part of the price decline took place abruptly in the years immediately following the War of 1812. Thus, between 1814 and 1821 prices fell in Great Britain about 41 per cent, and in the United States during the same period about 51 per cent. After 1821 the decline was interrupted by occasional cycles of inflation; but at the end of each financial crisis or panic, the price level stood somewhat lower than at the beginning. During the thirty-five-year period ending about 1850, the price level in Great Britain declined about 57 per cent and in the United States about 60 per cent. These declines are indicated on chart eight. The purchasing power of the dollar and of the pound sterling more than doubled. By 1850, prices were slightly lower than they had been in 1790,-sixty years earlier.

In part, this long-time fall of prices is accounted for by a slowing down in the rate of production of silver and gold. The average annual world production of gold during the thirty years after 1810 was only about $10,200,000, whereas it had been about $11,800,000 during the thirty years preceding. The average annual world production of silver during the thirty years after 1810 was about $22,500,000, as contrasted with $38,500,000 during the thirty years preceding. Taking the combined total of world production of gold and silver, we find that the annual average was about 35 per cent less after 1810 than before. This slump in output of specie was largely due to the demoralization of mining in the principal source of world supply, namely, Central and South America, in consequence of revolution and civil convulsion throughout those countries during the early decades of the nineteenth century. An additional factor was the exhaustion of some of the mines that had formerly been most productive. Had it not been for the development of new mines in Russia, the reduction of world output would have been even more drastic. Economists, statesmen, and historians of this period were keenly apprehensive of the results threatened by "the reduction of the money supply through an indefinite period." [1]

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[1] *Review of Economic Statistics*, 1923, p. 243; see also SILBERLING, *op. cit.*, 1919, p. 267; and CANNAN, EDWIN, *The Paper Pound of 1797–1821*, containing the Bullion Report of 1810.

[2] In this and the following chapters, the term, prices, refers to wholesale prices unless otherwise noted.

However, the extent of the decline in production should not be exaggerated. The per capita world stock of gold money fell only from about $1.19 in 1807 to about $1.00 in 1847. In the United States the per capita stock of specie, mostly silver,[2] actually increased from about $3.79 in 1813 to $5.42 in 1849.[3]

From 1821 to 1849 the net excess of specie imports over specie exports of the United States has been estimated at $72,714,000.[4] With specie flowing into the United States at a rate faster than the growth of population, and with the per capita stock of specie actually increasing, we cannot adequately explain the falling price level of the period solely by the slump in world production of the precious metals. Whatever was happening to the world in general, at least the United States was steadily building up a larger per capita store of the precious metals.

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[1] See WALKER, FRANCIS A., *Money*, 1883, p. 142.

[2] Until 1834, the mint ratio was 15 to 1 and the market ratio was about 15½ to 1. Silver, being the cheaper metal, drove gold out of circulation and out of the country. In 1834 the mint ratio was changed to 16 to 1, but the market ratio still remained at around 15½ to 1. Although gold thus became the dearer metal, it drove silver out of circulation very slowly and did not exert marked effects, especially in the West, until after 1850.

[3] See HEPBURN, A. BARTON, *The Contest for Sound Money*, pp. 120, 154.

[4] BULLOCK, C. J., WILLIAMS, J. H., TUCKER, R. S., *Harvard University Review of Economic Statistics*, 1919, p. 218.

For a more adequate explanation of the price decline, it is necessary to take into consideration the unsatisfactory condition of bank currency. Bank notes were issued not only by state banks, but, during its existence, 1791-1811 and 1816-1836, by the Bank of the United States. Although many violent fluctuations in volume of note issue occurred, nevertheless the amount per capita shrank from $8.99 in 1813 to $4.92 in 1849. To what may this scarcity of note issue be attributed? Doubtless the main factor was the chaotic status of banking. Banks expanded their notes recklessly while specie payments were suspended between 1814 and 1817; and when specie payments were resumed, they were forced to bring about a contraction of notes outstanding.

As long as the Bank of the United States was in operation, it served in a measure to check wild-cat note issues by state banks; but the refusal to renew the charter of the Bank from 1811 to 1816, and the final destruction of the Bank in 1837 undermined the steadying influence which the Bank should have exercised. Financial panics occurred in 1815, 1833, 1837, 1839, and 1847.[1] These panics were approached by land booms, speculative manias, establishment of new state banks, rash increases of bank notes, and sudden inflation of prices. They usually eventuated in suspension of specie payments in many parts of the country, widespread failures of banks, cancellation of worthless notes in circulation, contraction of the volume of currency, and sharp deflation of prices. After the panic of 1837, 210 state banks disappeared, or about one-fourth of all banks in the country; and notes in circulation shrank from $149,000,000 to less than $59,000,000. The currency supply per capita shrank from $13.87 to $6.87. As long as banks operated on such shaky foundations, they could not for long keep in circulation sufficient notes to meet the needs of the country. The scarcity of currency was due more to the crude state of banking than to a lack of specie. Banking failed to keep pace with the growing needs of the country.

Although banking was in this backward condition, production and trade grew very rapidly. It was the age of the industrial revolution in the United States. Manufacturing underwent remarkable development; railroads were built, and the lands of the West were settled. Expansion of trade occurred on a large scale, and waves of speculation swept over the country. All of these developments led to an enlarged need for a medium of exchange. When banks failed to provide a sound note issue, it was inevitable that prices should persistently fall to lower levels.

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[1] Thorp, Willard L., *Business Annals*, 1926, p. 42.

In England, as well as in the United States, banking was inadequately organized during the period under discussion. In 1816, England adopted the single gold standard. However, specie payments, which had been suspended in 1797, were not fully resumed until 1821. During the suspension period, numerous private banks had sprung up and had issued large quantities of notes, a substantial portion of which were in small denominations. Subsequent to 1825, issue of bank notes in denominations of less than five pounds was forbidden. In 1826, joint-stock banks were permitted to organize with the proviso that they could issue notes only outside of a 65-mile radius from the City of London. In 1833, joint-stock banks were permitted to organize in London, but only for the purpose of conducting a banking business of discount and deposit. Note issue was expressly forbidden. Gradually joint-stock banks came into existence and crowded out one after another of the private banks. The Bank Act of 1844 permitted existing private and joint-stock banks to continue in circulation an amount of notes equal to their issue outstanding at the time; but forbade any future expansion of issue beyond the then existing volume, and forbade banks newly formed in the future to issue any notes whatsoever. The Bank of England was permitted a note issue of 14,000,000 pounds secured by government bonds, but any excess above this amount had to be backed 100 per cent by gold bullion or coin. If joint-stock or private banks diminished their issue, the Bank of England might issue new notes equal to two-thirds of such diminution, with the consent of the government.

In the midst of this series of developments, the country was subjected to repeated crises and panics, coinciding in point of time approximately with those which occurred in the United States. Panics were accompanied by expansion of note issue, speculation and inflation, followed by bank failures, note contraction and deflation. After each crisis, the price level tended toward lower levels than existed before the crisis. Banking was precarious, notes were often short lived, and the permanent volume of currency was inadequate to maintain prices at a stable level. Moreover, production was increasing rapidly, trade and industry were expanding, and the need for more units of exchange was persistent. With currency supply restricted and currency demand stimulated, the price level sagged decade by decade.

The years between 1814 and 1850 were the formative period of the art of modern banking. After costly trial and error, the countries evolved sound banking practice. However, during the period of experimentation, banks were unable to furnish adequate currency and credit. Faced with this condition, and confronted with a decline in the rate of gold and silver production, the countries were unable to prevent a secular deflation of prices. The failure of specie, currency, or credit to keep pace with the growing needs of trade inevitably led to a long-time fall of prices.

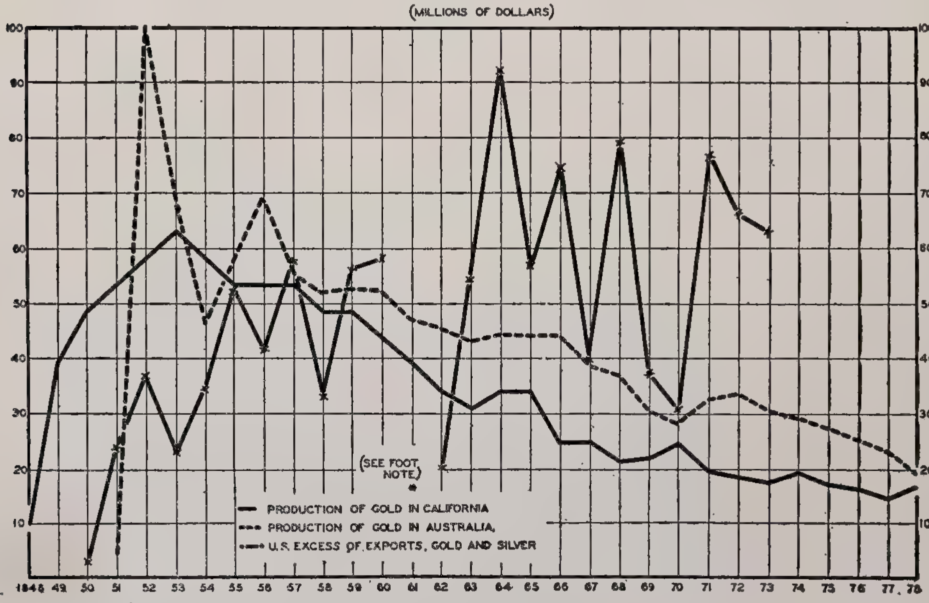
Chapter XI

GOLD PRODUCTION AND PRICES

(Continued)

Rising Prices, 1848-1873.—The discovery of gold in California in 1848 and in Australia in 1851 caused a remarkable increase in the production of that metal. This increase is apparent from the accompanying chart. The world output of gold suddenly increased from an annual average of about $36,000,000 to an annual average of more than $130,000,000. The climax of production from the new mines was reached within three to five years after their discovery, but the effect of enhanced production was still manifest during two decades thereafter. The world's stock of gold money rose from about $1,064,000,000 in 1849 to about $2,900,000,000 in 1874.

CHART NO. 10
GOLD PRODUCTION AND EXPORT 1848-1878
(MILLIONS OF DOLLARS)



*EXCESS OF IMPORTS, 1861.

Prices underwent a substantial inflation. England, which maintained the gold standard throughout this period, showed a rise in prices from 1850 to 1873 amounting to about 44 per cent. Substantial price increases also occurred in Germany, France, and other countries. In the United States, price fluctuations were influenced by the suspension of specie payments in 1861 and the subsequent maintenance of inconvertible paper money until 1879. In 1865, prices stood 112 per cent above the level of 1850; and in 1873, after much of the war inflation had been eliminated, prices still remained 27 per cent above the level of 1850. There can be no doubt that the value of the dollar suffered material depreciation during this period.

Although there has been much dispute as to the cause of the fall in the value of money, the preponderance of opinion among economists emphasizes the increased production of gold as one of the major causes, if not the dominating one. Gold was rapidly exported from Australia and California to the outside world. For instance, to consider the United States' product alone, between 1850 and 1873, that country's net excess of exports of specie, mainly gold, over imports was approximately $1,098,200,000. (See chart on p. 226.) The per capita stock of specie in the banks of the United States was only about $8.00 in 1860, as compared with nearly $7.00 in 1850. A very large amount of new gold was absorbed by the monetary systems of France and Germany and, to a lesser degree, by those of the smaller countries of Europe. Laughlin estimates that between 1850 and 1876 France and Germany absorbed approximately $1,564,000,000 of new gold.[1] This gold drove silver out of circulation and led to the establishment of the single gold standard in such countries. To the extent that gold merely displaced silver, it was not an addition to the total money supply, but was merely a substitution. Laughlin also estimates that during the period 1850-1876 India imported $440,000,000 worth of gold.[2]

Moreover, the consumption of gold in the industrial arts greatly increased during this period of time. At the end of the period, the annual consumption in the arts was about four times what it had been at the beginning. Had it not been for the absorption of the new gold supply in these various ways, the supply would undoubtedly have caused a much greater inflation of prices than actually occurred.

The broad diffusion of supply in countries formerly on the bimetallic standard, in India, and in the industrial arts, prevented acute violence in the price increase, but could not prevent a substantial upward movement.

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[1] *History of Bimetallism*, 1892, p. 145.

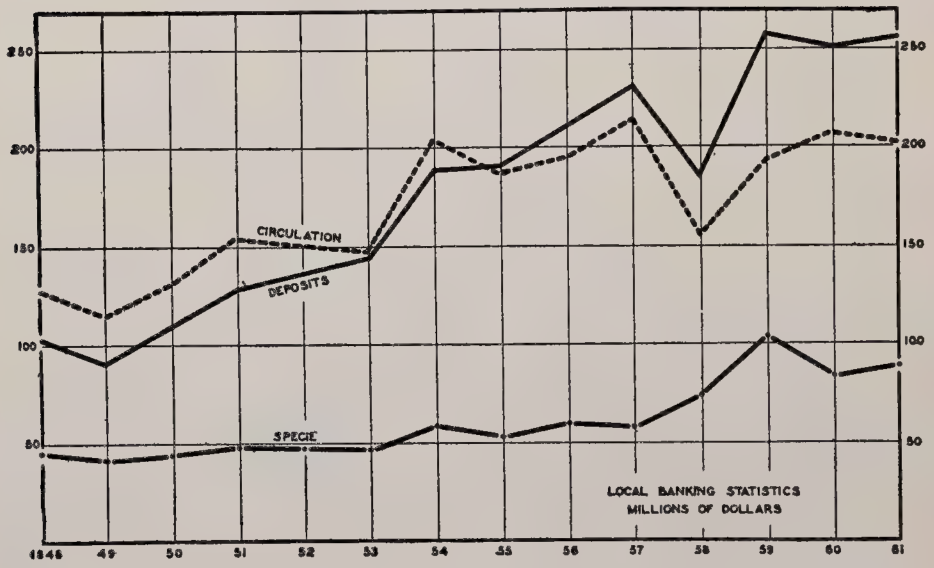
[2] *Ibid.*, p. 145.

On the side of demand, it is important to note the continued rapid growth of population and the rapid expansion of trade and production in leading countries. These factors, working on the demand side of the equation, aided in preventing a sudden and violent rise of gold prices.

It would not be correct, however, to attribute the enhanced supply of a medium of exchange solely to expanded gold output. It must also be attributed to the growth of sound banking. Gradually in the United States after 1850, conservative principles of banking were established; and deposit banking, as well as note issue, became of importance. This trend is shown by the accompanying chart.[1]

CHART NO. 11

STATISTICS OF STATE BANKS 1848-1861



With the establishment of National banks during the Civil War period, there was ushered in an era of banking development which meant a rapid substitution of credit for bank notes as a medium of exchange. In England, likewise, banking underwent very rapid growth, particularly with respect to deposit banking and checking accounts.

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[1] For the original data, see Dewey, D. R., *Financial History of the United States*, Ninth Edition, 1924, p. 260.

The movement of prices cannot be explained without taking into account these extraordinary banking developments. Just as, prior to 1850, banking had lagged behind the general development of trade and production, now it ran ahead, and yet did so on conservative and sound lines of permanent development. The new gold mines of California and Australia most certainly would not have affected price levels as seriously as they did, had it not been for this attendant circumstance of banking expansion.

The situation in the United States was abnormal in the sense that during part of the period the country employed fiat paper money. Although perceptible inflation had appeared between 1850 and 1860, the more violent aspect of inflation did not appear in the United States until after the suspension of specie payments in 1861. The chart on page 214 shows the price fluctuations of this period, on both a paper and a gold basis. The greater part of the rise of prices took place under the influence of excessive issues of greenbacks. Nevertheless, substantial inflation would undoubtedly have taken place had we remained on the gold standard. In 1865, prices on a gold basis, that is, adjusted for the gold premium, stood 35 per cent above the level of 1850; whereas in other countries, the peak was delayed until about 1873.

The history of the period illustrates the principle that an abnormally rapid production of gold tends to cause price inflation in gold-using countries. Doubtless there were many other factors entering into the price fluctuations of the period. However, these other factors are far from sufficient to offer a complete explanation of the inflationary period. The output of gold was a primary cause of the price change. To quote J. E. Cairnes, whose financial studies of this period are particularly convincing:

> But prices having risen, to what is the rise to be attributed? Here too, as I have said, there is a divergence of opinion. Amongst economists I think it is pretty well agreed that the advance is, at least in large measure, due to the effects of the gold discoveries.[1]

Falling Prices, 1873-1896.—During this period, the relations between prices and the precious metals were exceedingly complex. Specie payments in gold were resumed in 1879. Although bimetallism had been abandoned, special silver coinage legislation was passed in 1878 in the form of the Bland-Allison Act, and, in

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[1] Cairnes, J. E., *Essays in Political Economy*, 1873, p. 3.

1890, in the form of the Sherman Silver Purchase Act. These laws resulted in large purchases of silver by the government and in forcing masses of silver coin and silver certificates into circulation, but they did not constitute an abandonment of the gold standard. During this period, the gold standard was likewise adopted by other leading countries of the world, and the gold requirement of the world was thereby greatly intensified. Population underwent a steady increase, and trade and industry had a remarkable era of expansion.

The trend of wholesale prices was downward. The price level in Great Britain declined about 45 per cent between 1873 and 1896; and during the same period, the price level in the United States declined about 45 per cent. (See chart on page 214.) The decline in the United States differed from that in Great Britain, inasmuch as 1873 was the peak of the preceding period of rising prices in Great Britain, whereas 1865 was the peak in the United States. The decline in the United States from 1865 to 1896, expressed in paper greenbacks, was approximately 67 per cent. The greater part of the decline in the United States occurred abruptly in the post-war years when inconvertible paper was the monetary unit. After 1878, the decline was very moderate and gradual. The direction of price movements in these two countries was paralleled by similar price movements in most European countries. The fact of a secular price decline over a world-wide area is established beyond serious dispute.

However, the cause of the decline has been much disputed by economists. Probably the consensus of opinion is that an inadequate money supply due to a slackening in the rate of gold production, accompanied by an extraordinary demand due to a rapid increase in population and trade and to the widespread adoption of the gold standard, accounts for the price decline.

Prior to 1870, the yearly average world output of gold was about $130,000,000, whereas during the next twenty years, it was only about $111,000,000. Although this slowing down in the gold output was not severe, nevertheless, coming at a time when the demand for gold was rapidly increasing, it had the effect of raising the value of this metal and lowering the price level.

Silver increased from a yearly average output of less than $60,000,000 before 1870 to one of around $100,000,000 in later years. The extraordinary supply of new silver coming at a time when silver was being demonetized in a great many countries, was accompanied by a cheapening of that metal. Powerful factions in the United States endeavored to create a demand for silver by passing laws compelling the government to purchase large quantities of the metal and to put it into circulation either by coinage or by the medium of silver certificates backed by silver bullion. However, the net effect of these efforts was the expulsion of gold from the United States through the use of gold in the settlement of adverse international balances of payments. The silver currency was substituted in large part for other forms of currency, particularly National bank notes, and was not an addition to the circulation. Silver was not, therefore, a check to the persistent price deflation of the period.

The world's stock of gold increased from about $2,887,000,000 in 1874 to about $3,450,000,000 in 1889. The world's stock per capita increased from about $2.30 per head in 1874, to only about $2.40 per head in 1889. The world's demand, however, increased more rapidly than the population, due to growth of trade and the adoption of the gold standard in various nations. The stock of gold in the United States alone increased from $352,000,000 in 1880, to $680,000,000 in 1889. This increase was not, however, in the nature of gold inflation, but was chiefly a means of making up the deficit in gold stock which had accumulated during the Civil War period when the United States was on the inconvertible fiat standard. The net excess of imports of specie over exports in the United States from 1874 to 1895 was $111,900,000. The movement, however, was extremely irregular and reflected numerous financial crises and panics. Relatively little gold was imported by England, but that country underwent a very rapid increase in deposit banking, chiefly through the medium of the joint-stock banks. The greater part of the new gold available as money was absorbed by the United States, France, Germany, and other European countries which went on the gold standard. During a large part of the period, the absorption of new gold in the industrial arts and in the Orient was very heavy. For instance, during the five-year period ending 1884, these uses claimed 78 per cent of the new gold produced. The scarcity of the metal available as money was reflected in the enhanced value of gold and the fall of prices.

Rising Prices, 1896-1914.—The discovery of gold in South Africa in 1889, and similar discoveries soon thereafter in Alaska and the Klondike region, led to a rapid increase in gold production during the next quarter of a century. Discovery of new gold mines was accompanied by discovery of new processes of working old gold mines, a discovery which led to intensive exploitation of mines that had formerly been abandoned. Whereas, prior to 1890, the annual gold production of the world had been only about $111,000,000, it rose to a peak of $470,026,251 in 1915. Annual production more than quadrupled. The world's stock of monetary gold increased from about $3,450,000,000 in 1889 to about $8,058,000,000 in 1914. Of course, population was increasing in the meantime, but the per capita stock of the entire world showed a sharp increase from about $2.40 in 1889 to about $4.59 in 1914. The per capita stock of gold money in the United States increased from $8.50 in 1896 to $18.90 in 1914. Industrial consumption and exports to the Orient did not increase as rapidly as total production, with the result that a large fraction of the new output was available for monetary uses. From 53 to 63 per cent of the total production was available as money during this period, as compared with from 22 to 42 per cent during the period from 1874 to 1890.

The new gold not only went into circulation, but also into bank reserves, and indirectly sustained rapidly growing volumes of bank credit. Under the impact of the expansion of gold and credit, prices rose in practically all parts of the world. The rise in Great Britain was approximately 39 per cent, and that in the United States approximately 46 per cent.

The demand for money was increasing very rapidly, owing to the growth of trade and population. However, this growing demand was more than offset by the extraordinary rate of increase in the supply of gold. As supply outran demand, the value of gold declined and prices underwent a long-time inflationary swing.

Rising Prices, 1914-1920.—The highest gold production on record was attained in 1915 when the world output exceeded $470,000,000. Partly due to rising costs of production and partly to exhaustion of some of the better grade ores, gold output decreased during the period of the World War, and reached a low point, in 1920, of $332,000,000.

Regardless of this slackening in the rate of gold output, prices in all countries underwent rapid inflation. All of the leading industrial countries except the United States suspended gold payments and relied upon some form of inconvertible paper money. Fiat note issue and bank deposits expanded to unprecedented proportions. Prices in Great Britain reached a point in April, 1920, 213 per cent above the pre-War level, and in France, 488 per cent above the pre-War level. Prices in Germany during March, 1920, stood 1610 per cent above the level of 1913; but the peak of prices in that country was delayed until 1923-1924, when prices were more than a hundred trillions per cent above the 1913 level. The remarkable inflation in fiat money countries was based upon a rapid expansion of inconvertible notes and bank credits, and was not traceable to conditions of the gold supply. The quantity of money and credit had been completely disconnected from gold.

In the United States, prices reached a peak in May, 1920, 147 per cent above the 1913 level. Inflation, drastic and violent, took place, even though the United States remained on the gold standard. In part, this inflation was traceable to the huge influx of gold by import, from European countries; but, for the larger part, it was traceable to the expansion of note issue and bank deposits and the lowering of reserve ratios by the introduction of the Federal Reserve systems. Under the new law, each dollar of gold would support a larger amount of notes and deposits than ever before. With narrower reserve ratios permitted, and with $830,000,000 added to the nation's stock of gold, it was to be expected that price inflation would ensue. Money in circulation increased about 78 per cent and bank deposits increased about 139 per cent, whereas the physical volume of business increased only about 11 per cent.[1] Of course, many other factors entered into the situation, such as abnormal demand for goods, scarcity of essential commodities, price fixing, transfer of man power to and from military service, and War and post-War psychology. But the fundamental factor which made possible the rapid increase in prices was doubtless the extraordinary expansion of money and credit.

Falling Prices, 1920-1927.—A wave of speculation and over-expansion culminated in the spring of 1920, and was followed by liquidation and contraction in leading markets. Prices in Great Britain fell from an index of 313 in April, 1920 (1913 = 100) to 157 in December, 1921; in France from 588 in May, 1920, to 326 in December, 1921; in Germany from 1710 in March, 1920, to 1310 in May, 1921; and in the United States from 247 in May, 1920, to 140 in December, 1921. These sharp declines were accompanied by financial crises, high discount rates, and, in most countries, contraction of note circulation and bank deposits. The rate of gold production had practically nothing to do with the abrupt deflation of 1920-1921.

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[1] According to estimates by KEMMERER, E. W., *High Prices and Deflation*, 1920, pp. 7, 12, 27.

After 1921, the world-wide course of prices became quite irregular. In France, where the gold standard was not resumed, prices rose 700 to 800 per cent above the 1913 level. In Germany prices rose to an index of 126,160,000,000,000 at the end of 1923 (1913 = 100); but in the middle of 1924, when Germany adopted the gold-exchange standard, put into operation the Dawes plan of reparations payments, and substituted new gold currency for old paper at the rate of one reichsmark for one trillion former paper marks, prices were lowered to an index of about 130. In Great Britain prices fluctuated within range of the indexes 147 to 174; but after resumption of the gold standard in 1925, they settled down at an approximate index of 150. In the United States prices fluctuated within rather close proximity to indexes of 145 to 155.

The world's stock of money gold in 1926 has been estimated by Kitchin at about $10,560,000,000, as compared with $8,058,000,000 in 1914.[1] The per capita stock increased from about $4.59 in 1914 to about $5.39 in 1926. Whereas the annual production of the five years ending 1915 averaged about $460,000,000, the production of the five years ending 1924 averaged only about $350,000,000. The outlook for a recovery of the high pre-War level of production is discussed in the following chapters, and the interrelations of gold and price trends are there analyzed.

Review of Modern Price Trends.—The accompanying table contains a review of the major price trends since 1790. This compact form of expression of financial data helps to visualize the fundamental movements of gold and prices over a period of 136 years.

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[1] Kitchin, Joseph, *Appendices to Report of Royal Commission on Indian Currency and Finance*, 1926, vol. III, pp. 521, 523, 525, 534.

TABLE I

GOLD AND PRICES, 1790–1926

Period	World Stock of Gold Money[1] in Millions	Price Change[2] Comparison with Period Preceding		World Gold Money Stock Per Capita	Interval	Average Annual Increase in Gold Money in Millions	Compound Rate of Increase Per Annum Per Cent	Causes of Price Trends
		U. S. Per Cent	Great Britain Per Cent					
1790	$700			$1.14				1. Overissue of fiat notes. 2. Increased silver output.
1814	800	+ 119	+ 97	1.08	24 yrs.	$4.1	0.6	
1850	1,115	− 60	− 57	1.10	36 yrs.	8.7	0.9	1. Slackened rate of production of gold and silver. 2. Undeveloped banking and inadequate note issue.
1873	2,856	+ 112 [a] + 35 [b]	+ 44	2.33	23 yrs.	75.6	4.2	1. Greatly increased gold output. 2. Rapid growth of bank currency and credit. 3. Fiat money in U. S.
1896	4,359	− 45 − 67 [c]	− 45	2.93	23 yrs.	65.3	1.9	1. Slackened rate of gold production. 2. Wide adoption of gold standard. 3. Trade growth.
1914	8,058	+ 46	+ 39	4.59	18 yrs.	205.5	3.5	1. Greatly increased gold output. 2. Steady growth of banking.
1920	9,420	+ 128	+ 195	5.12	6 yrs.	227.0	2.6	1. World War overissue of fiat money in most countries. 2. U. S. gold imports heavy and reserve ratios lowered. 3. Gold output slackened.
1926	10,500	− 33	− 52	5.39	6 yrs.	180.0	1.8	1. Return to gold standard by many countries, contraction of notes and deposits. 2. Annual gold output below pre-War level.

[a] Prices on paper basis. [b] Prices on gold basis. [c] For period 1865–96.

[1] Estimates based upon reports of Director of the United States Mint, and of Joseph Kitchin, *ibid.*, p. 534.

[2] Price indexes as computed by John Parke Young, *European Currency and Finance*, Commission of Gold and Silver Inquiry, United States Senate, 1925, pp. 436, 450.

Conclusions.—The wide range of material covered in the present chapter and the preceding chapter affords a basis for a number of important observations.

1. Throughout ancient and mediæval times, serious changes in the supply of precious metals available as money caused corresponding changes in price levels.

2. Three great periods of discovery of the precious metals, namely, the sixteenth century when gold and silver were found in Central and South America; the middle of the nineteenth century when gold was found in California and Australia; and the latter part of the nineteenth century when gold was found in South Africa, Alaska, and the Klondike, were followed by three respective periods of prolonged price increases.

3. The suspension of specie payments in England during the Napoleonic Wars, in the United States during the period centering about the War of 1812 and again during and after the Civil War, and in most European countries during the World War, was followed by overissue of notes, overexpansion of bank credits, a premium on specie, and pronounced price inflation.

4. Prior to 1830-1840, the factor of gold supply alone does not correlate closely with price movements, partly because silver was a very important part of the money supply, and partly because of the uncertain and irregular development of bank notes and deposits.

5. During the past 136 years, there have appeared three very high price peaks in the United States, and with certain allowances for minor differences, throughout the industrial world. These peaks have coincided with three periods of war, namely, the Napoleonic Wars and the War of 1812, the Civil War, and the World War.

6. The effect of a marked change in the rate of gold output upon prices depends in large measure upon the simultaneous changes which take place in note issue and deposit banking.

7. The consumption of gold in the industrial arts has at times amounted to more than half the annual production of new gold, and at times has shrunk to about 15 per cent of the new production. During the past thirty-five years, the tendency has been to absorb about one-quarter of the new production in the arts. The demand of the arts for gold has reflected fairly clearly the

fluctuations in the value of gold. Increased industrial demand has appeared during periods when gold has been cheapened by overproduction and when its value in terms of commodities, as indicated by a rising price level, has undergone marked depreciation. Demand in the arts is also sensitive to the growth of income and of luxury on the part of more numerous classes of society.

8. Consumption in India, China, and Egypt has been primarily for purposes of hoarding. It is said that gold is produced in South Africa only to be buried in the Orient. The drain of gold to the Orient has in some years been almost negligible, but during the greater part of the last century it has been sufficient to absorb from 10 to 20 per cent of the new production each year. During the five years ending 1924, the Oriental demand absorbed about 26 per cent of the new output, or nearly $100,000,000 annually. The proportion available as money has shown a tendency to decline in recent years.

9. The value of money has been influenced by demand as well as by supply. Demand has reflected not only changes in industrial consumption and absorption by the Orient, but also adoption or abandonment of the gold standard by various countries, growth of population, growth of trade and industry, development of bank notes and credit as substitutes for gold in circulation, and abnormal situations, such as wars.

10. The particular form of price fluctuation which is responsive to the rate of gold production is the secular trend, that is, the trend over a period of a decade or more. This long-time trend is punctuated by cyclical waves of prices, and by unusual occurrences, such as wars.

11. Changes in the secular trend of prices lag behind changes in the rate of gold production by about four to seven years. The effects of discoveries in California, Australia, Alaska, and South Africa were not immediate, but were perceptible within a few years, and gradually manifested their full force over a period of decades.

12. With reference to the quantity theory, we may note that the history of specie and prices warrants the following conclusions:

(a) A large permanent increase in the rate of gold production tends, in so far as it is not offset by changes in monetary demand, to produce a secular increase in the price level, and to diffuse this increase with approximate equality among all countries on the gold standard or gold exchange standard.

(b) A suspension of gold payments in time of war has commonly resulted in overissue of bank notes and credits and a sharp, violent increase of prices, followed by sharp and violent contraction and deflation.

(c) Lessening of the proportion of the gold money stock which is put into actual circulation, or lowering of the reserve ratios between gold and notes or gold and bank deposits, increases the efficiency of a given amount of gold, and tends to affect the value of gold in the same manner as an equivalent increase in the actual rate of gold production.[1]

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[1] The accompanying chapters on Gold may be supplemented by reference to the following subsequently written articles:

EDIE, LIONEL D., "Rate of Increase of Monetary Gold Stock," *Journal of Political Economy*, October, 1928; "Gold Economies and Stable Prices," *Journal of Political Economy*, February, 1929; "The United States' Share of the World's Gold," *Journal of Business*, July, 1928; "Capital, The Money Market, and Gold," *Publications of the Bureau of Business Research*, vol. i, School of Commerce, University of Chicago, 1929.

Chapter XII

THE WORLD STOCK OF GOLD MONEY

Factors Governing Production.—Gold production offers a unique case in the economics of cost and price—unique because gold is the only commodity in modern industry of which the price is absolutely fixed. Thus, the price of an ounce of pure gold is arbitrarily set by law in the United States at $20.67 per ounce. The United States mint will buy all gold presented at that price, less, of course, a slight charge for brassage. Price fixing as such is not unusual, but price fixing of this kind is peculiar to gold. Government regulation of public utility rates constitutes price fixing, but it is price fixing of a flexible character, calculated to allow a fair return on a fair valuation. When conditions of cost change, public service commissions must change rates accordingly. But if conditions of cost change in the field of gold production, the price paid for gold remains constant. During the World War, governments fixed the prices of ordinary articles of merchandise; but always the criterion was to find the price which would bring about a proper balance between output and demand. In all such cases, price fixing consisted of varying the established scales of prices as often as new conditions of supply and demand arose. But in the case of gold, price fixing consists of adhering constantly to the established price, no matter what happens to the supply and demand of the metal.

To define further the nature of gold production, we should note that it is an example of an industry of variable supply at increasing unit cost. In this respect, gold mining is similar to all of the extractive industries. The supply of gold is variable even though no new discoveries of gold fields are made. The old fields contain great quantities of ores as yet unexploited. The supply of gold can be made to vary according to the intensive application of mining methods to these ores. But the more intensive the mining process, the greater the unit cost beyond a certain point. Intensive gold mining soon reaches the point of diminishing returns. A similar result is witnessed in extensive mining.

Such mining involves utilizing inferior grades of ore and incurring greater cost per ounce of new metal produced.

Under conditions of fixed selling price, variable supply, and increasing unit cost, gold miners will tend to expand their production until cost approximates $20.67 cents per ounce of pure gold. They will tend to carry production up to the margin where additional effort would not bring any additional net gain. This tendency assumes, of course, a substantial amount of competition among the mine operators. It should be clear, in the light of the above statement of principle, that any unusual increase in the expense of operation will result in abandonment of the poorest mines and a curtailment of supply. Conversely, any decrease in the expense of operation will result in the utilization of mines formerly too poor to be operated and an expansion of supply. In no case will the price of gold be changed. The cost variation must exert its influence solely upon the quantity of output. Production will vary inversely with cost.

Causes of Rising Costs of Gold Production.—Whenever rising costs are due to overintensive operation of mines or overextensive exploitation of inferior grades of ore, the mine operators hold it within their own power to curtail production voluntarily. But there are two factors affecting cost which cannot be controlled so readily. These are the exhaustion of deposits of the metal and the increase of the general level of commodity prices.

Formerly, the bulk of the world's output was derived from alluvial deposits, and the mining process consisted of digging surface earth or river sands and of separating the gold by a washing or sluicing process. New discoveries were the signal for a "gold rush" and swift exploitation of easily accessible deposits. In a short time the best deposits would become exhausted, and only a limited number of laborers would persist in mining the less productive resources remaining. Now, however, the bulk of the world's output is derived from rock formations. The ores are crushed and treated chemically with chlorine or cyanide of potassium. This process has made possible the utilization of the ores of South Africa. At first, only the African ores near the surface were mined. Later, engineers demonstrated the practicability of digging shafts 2,000 to 5,000 feet deep and of thereby tapping rich additional sources. Obviously there is a point of diminishing returns reached by this kind of mining operation.

The labor of sinking shafts is very expensive and the capital outlay is very heavy before any returns can be realized. There is ordinarily an interval of from five to eight years between the original investment in such an enterprise and the actual sale of the first gold produced. The life of such a mine, once it is in operation, is on the average about twenty years. At the end of twenty years, the capital involved must largely be scrapped, and new mines must be ready for operation. This process can be repeated as long as geological deposits of the right ores are available. Such deposits are still very great, but exploitation of them has already been carried up to the point of diminishing returns in most fields. The trend is toward exhaustion of superior ores and dependence upon inferior ores. Inevitably, this forced resort to second-grade ores raises the unit cost of output and tends to restrict the quantity produced.

An increase in the general level of prices introduces an addition to expense which cannot be controlled by the gold mining industry. The rise in wholesale prices of commodities forces the gold miner to pay more for capital goods. An accompanying rise in wages forces him to pay more for labor. These mounting costs tend to wipe out the margin of profit. In so far as any profit remains, it has a diminished purchasing power due to the increased cost of living. In any other industry, the proprietor might try to offset the high costs by raising selling prices. In the gold industry this recourse is prohibited by virtue of the fact that the selling price of gold is arbitrarily fixed. Hence the gold miner is more completely at the mercy of changes in the price level than any other class of producers. The quantity of gold mined will tend to fall when general prices rise, and to rise when prices fall.

Methods of Reducing Costs of Gold Production.—The primary recourse of the gold miners in combating rising general prices is to increase the efficiency of operation. In the past, this has involved developments in hydraulic mining; perfection of chemical processes using chlorine or cyanide of potassium; and invention of new machinery for digging, hoisting, and other mechanical tasks. Such technological improvements may in part or even entirely offset a rising price level, and during stable or falling prices, may result in very material reductions in unit costs of output. Although data are scanty, nevertheless there are certain sources of information available which give interesting illustration of the struggle to reduce costs by improved methods of operation.

J. F. Johnson studied the trend of mining costs from 1896 to 1906—a period when wholesale commodity prices advanced about 32 per cent. He reached the conclusion that "Improvements in machinery, in metallurgical processes, and in the organization of working forces have been going on, and up to date have fully overcome the advancing tendency of the price level."[1] H. N. Lawrie estimates that from 1912 to 1918 the average price of materials used in mining in the United States increased 85 per cent; the total cost per ton of ore worked in a typical mine increased from $7 to $12; the total cost per fine gold ounce increased from $11.70 to $30; and the profit per ounce decreased from $8.30 to a net loss at the end of the period.[2] During this period many mines shut down altogether, many continued to operate even at a loss, a very few made a profit, and the total production in the United States was cut in half.

The situation in South Africa is of special interest, because more than one-half of the world's output now comes from the Rand district. The district is further subdivided into the Old Rand and the New Rand. The superior grades of ore in the Old Rand have been exhausted, and the cost of mining the inferior grades has been rising. On the other hand, the resources of the New Rand have not reached the zenith of their possibilities, and afford an opportunity for relatively easy exploitation. Consequently, from 1915 to 1925, the operating cost of producing an ounce of fine gold in the Old Rand rose from $14.88 to $17.16, whereas that in the New Rand fell from $11.57 to $10.75. In 1925 the New Rand paid three times as much dividends per ounce of gold mined as did the Old Rand. During the period, the annual output in the Old Rand decreased 30 per cent, whereas that in the New Rand increased about 130 per cent.

The forementioned cost changes took place in the face of a rise in wholesale commodity prices in South Africa amounting to about 30 per cent. In some other gold-producing countries, the rise of prices was more severe and the increased cost of gold mining correspondingly greater. Thus, the price level in the

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[1] *Money and Currency*, 1921, p. 216.

[2] *Report of the American Mining Congress*, 1920, p. 23.

United States in 1925 was about 60 per cent above the pre-War level. This increase of costs bore with great hardship upon the mine operators and cut their production in half. On the other hand, an equal increase of wholesale prices in Canada did not prevent that country from practically doubling her quantity of output over the same period of time. In each country we have a combination of factors acting simultaneously. These factors include the exhaustion of resources, the rise of commodity prices and wages, and the improvement of operating efficiency. The resultant of these factors varies widely from country to country. Nevertheless, their composite result on a world-wide scale is of very great importance, and is measured by the changing rate in aggregate world production. From 1915 to 1925 the composite result was a decline in world output from $470,330,000 in the former year to $394,000,000 in the latter year, a decline of 16 per cent.[1]

The Stock of Gold Money and the Value of Money.—We have just considered how a change in the price level, or in the value of money, affects the cost of gold production and the volume of production. We may now turn the matter the other way around and inquire how a change in the quantity of gold production will affect the value of money. A classic statement of the law of the value of gold or other precious metal used as money was made by John Stuart Mill, as follows: "Their natural value is in the long run proportional to their cost of production in the most unfavorable existing circumstances, that is, at the worst mine which it is necessary to work in order to obtain the required supply." [2]

When Mill speaks of the value of money, he has in mind the purchasing power of money over commodities in general. This purchasing power we attempt to measure at the present time by an index of the general level of prices. Mill's phrase, "in the long run,"[2] means substantially the same time factor which the present-day statisticians refer to as the secular trend. His phrase, "the most unfavorable existing circumstances," is a concept which modern economists would be likely to refer to as the marginal cost or the marginal producer. Starting from Mill's law, and using terminology of modern economics, we may state a law of production as follows: The quantity of gold that can be produced under existing marginal costs will be an important factor in determining the secular trend of the general level of prices.

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[1] The foregoing estimates are largely derived from studies by Joseph Kitchin, "Evidence presented to The Royal Commission on Indian Currency and Finance," 1926; and articles on "Gold Production" in the *Review of Economic Statistics*, Harvard University, August, 1921, April, 1924, and July, 1926.

[2] *Principles of Political Economy*, 1848, book III, ch. IX.

This statement calls for explanation at a number of points. First, it does not overlook the fact that in the past a great deal of production has taken place at less than cost. Gold discoveries, especially of alluvial deposits, have resulted in a rush of adventurers, most of whom have lost much more than they have gained in the quest for gold. Even after mining activity has settled down upon a permanent basis, a large part of the production is highly speculative and involves a net loss to the operator. Thus, Johnson found that for the year 1904 in South Africa only about one-half of the companies paid dividends. In Australia, out of 66 companies, only 16 paid dividends.[1] During the period centering about the World war, only a very few of the companies operating in the United States made a profit. Probably the larger part of the present world stock of gold money has been produced at a loss. However, in recent times, the industry has been brought more fully under corporate control and has come to be managed with due regard for reasonable yield on investment. The gambling element has been minimized and mining activity has become a more settled economic form of enterprise. Under modern conditions, therefore, it tends to be true that the bulk of current output over a period of years is within the line of marginal cost.

A second explanation of the general principle formulated above relates to the importance of overhead cost and fixed capital investment in the business. A heavy investment is necessary before mines become productive. Once this investment has been made, there is no way of getting the capital out of the industry. If the mine has to be kept idle for a time owing to a sudden rise of costs, or if it has to be abandoned permanently, there is an irrecoverable loss of the invested capital. Many mine owners operate temporarily even though not all of the overhead can be met, considering it more advantageous to meet part of the overhead than none of it. They hope eventually, of course, to place operation on a genuinely profitable basis. Overhead cost tends to prevent sudden fluctuations in volume of operation. It introduces a requirement for stability of output even though direct operating costs are varying.

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[1] Johnson, *op. cit.*, p. 217.

A third explanation of the major principle has to do with the very slow rate at which current output can alter the accumulated stock of gold. The current output has in recent years ranged within 2 to 4 per cent of the existing stock of gold. A boom mining year would not increase the world's stock of gold money by more than about 4 per cent. Obviously, this rate of increment cannot fundamentally alter the supply of gold money over short periods of time. Consequently short-time fluctuations of the price level cannot be attributed to changes in current production. It is only the secular trend of prices which correlates with the secular trend of gold production. In the long run a cumulative year-to-year increase of the gold supply will affect the price level.

A fourth explanation relates to the lag between gold discovery and financial utilization of the new specie. After new rock formations are discovered, from five to eight years elapse before modern mining equipment can be installed and the salable product put on the market. After the gold has entered bank reserves, further time elapses before banks can expand their credit and note issue. Not until this stage has been reached does the price level effectively respond to the influence of the new money supply. Hence, prices lag considerably behind the discovery of new sources of supply. In the long run they respond, but the intervening lag is of great importance in estimating the correlation between gold and prices. This lag is ordinarily from five to seven years. A cumulative change in the rate of gold production will require this lapse of time in order to exert a marked influence upon the secular trend of prices.

The four factors qualifying the general statement of relations between gold cost, production, and value may be summarized as follows: First, a considerable amount of gold is produced at a net loss; second, a heavy overhead cost means that failure to operate mining properties on a permanent full-time basis is particularly injurious in this branch of enterprise; third, owing to the enormous existing stock of gold, the current output in any single year can affect total supply by only a very small per cent;

fourth, any change in the secular trend of prices lags several years behind the corresponding change in gold production. Against this background of qualifying factors, the general law itself may be repeated: The quantity of gold that can be produced under existing marginal costs will be an important factor in determining the secular trend of the general level of prices.

From a review of the chapter up to this point it will be noted that first there was worked out a statement of the effect of a change in price level upon quantity of production, and, second, a statement of the effect of a change in quantity of production upon the price level. This twofold viewpoint is necessary. Simultaneously, prices are affecting quantity, and quantity is affecting prices. The two factors are acting and interacting upon one another all of the time. An increase of the price levels tends to lower the quantity of gold produced. An increase of the quantity of gold produced tends to raise the price level. A mutual cause and effect relationship is thus maintained between gold and prices, and this mutuality of cause and effect must always be taken into account in explaining the trend of either production or prices at any given time.

The Prospect of New Gold Discoveries.—The discoveries of gold in Australia and California occurred at a time when exploitation of old mines had reached a point which threatened early exhaustion of such resources. Again, the discoveries of gold in South Africa came at a time when exhaustion of old mines appeared imminent. Because of these historical incidents, some observers have loosely assumed that whenever present gold resources face exhaustion, people will be spurred on to search for new mines, and that resulting discoveries will avert any possible gold shortage.

There is no sound basis for this sanguine assumption. It is bad inductive logic to assume an historical law from two instances only. The notion that history will repeat itself, and therefore that new mines will be discovered whenever need for them becomes urgent, is superficial in the extreme. The present situation must be studied by itself with a view to understanding its peculiarities and differences.

The distribution of the world's gold production is shown by the accompanying table:

TABLE I

PRODUCTION OF GOLD BY COUNTRIES, (1915–1925)

Country	1915		1925	
	Value	Per Cent	Value	Per Cent
North America				
United States	$101,035,700	21.	$ 47,956,991	12.3
Canada	18,936,971	4.	35,880,819	9.2
Mexico	6,559,275	1.	16,309,929	4.
Central America	2,970,271	.5	2,000,000	.5
South America				
Bolivia and Chile	814,418	....	1,407,000	....
Brazil and Guianas	5,757,254	1.	3,467,389	1.4
Colombia and Ecuador	5,998,822	1.	2,750,000	....
Peru and Uraguay	1,121,727	.2	2,433,756	1.5
Venezuela and Argentina	612,796	....	687,329	....
Europe				
France, Italy, and Great Britain	1,421,561	....	704,155	....
Spain and Portugal	661	.3	20,000	.6
Balkan States	201,219	....	1,402,955	....
Germany, Norway, etc.	22,532	....	132,920	....
Australia and New Zealand	49,397,797	10.	13,914,610	3.
Asia				
India	11,522,457	2.	8,140,711	2.
China	6,544,169	1.	4,990,758	1.5
East Indies	24,003,302	5.	5,693,546	1.5
Japan	5,385,917	1.	5,581,394	1.5
Russia and Siberia	28,586,392	6.	21,931,778	5.5
Africa	217,639,599	46.	218,497,286	55.5
Total	$470,466,214	100.0	$394,003,335	100.0

Since 1915, the United States and Australia have suffered a sharp decline in production. Canada and Mexico have enlarged production somewhat, but both of these countries are relatively small producers when compared with the world's total. The bulk of new gold comes from South Africa, and this district should further be subdivided into the Old Rand (Central and Western) and the New Rand (Eastern). The production of these subdivisions in recent years has been as follows:[1]

TABLE II

Gold Production of South Africa

	Old Rand	New Rand	Total Rand
1913	$151,820,100	$22,463,800	$174,283,900
1923	106,639,600	77,314,100	183,953,700
1926			223,070,640

The Old Rand has declined severely, but the New Rand has expanded sufficiently to more than offset the loss. For the time being, the New Rand is undergoing intensive exploitation and is showing a remarkable capacity to yield gold. However, it is only a question of a short period until the law of diminishing returns will probably be felt in the New Rand. This district contains a vast amount of low-grade ores, but efficiency in exploiting these ores has its limits. More than 95 per cent of the gold content of the ore is reclaimed under modern methods of treating the ore. For each ton of ore milled, the gold obtained in the New Rand is only about $8.55, and that in the Old Rand only about $5.96. In light of these considerations, we may conservatively estimate that during the next decade production in the Rand as a total will range between $200,000,000 and $250,000,000 annually, and may begin to show a gradual tapering down.

The bulk of gold now comes from ores such as those of the Rand district. Fifty years ago the bulk came from alluvial deposits. Now, not more than 5 to 10 per cent comes from the latter source. From time to time alluvial discoveries are made, but their productivity is on a relatively small scale. Thus the famous Klondike region at its best never produced more than $25,000,000 of new gold annually,—an amount quite small in comparison with the world's total output. Moreover such alluvial deposits are usually exhausted very rapidly. Hence the prospect of augmenting gold production by new discoveries of this type is very narrowly limited.

But it may be said that new ores of great richness will be discovered. In answer to this it may be observed that in light of the great thoroughness of geological surveys of rock formations in most parts of the world in the past generation, the likelihood that unknown sources of gold ores exist has become less and less. It is, of course, always possible that discoveries will be made. No one can say positively that new findings of great importance cannot be made.

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[1] Kitchin, Joseph, *Review of Economic Statistics*, 1924, p. 75.

The Prospect of Exploiting Low-Grade Ores.—Over wide areas, rock formations of the world are known to contain a limited percentage of gold. If these lower grade ores could be utilized on a commercially profitable basis, they would make possible a considerable increase in gold production. However, this prospect faces certain serious difficulties. Under existing conditions of efficiency and technological process, the likelihood that poorer ores can be used is small. The ores now being exploited in the Rand contain from $\frac{1}{80,000}$ th to $\frac{1}{110,000}$ th parts gold. This means that it is necessary to treat about three tons of ore in order to obtain a single ounce of gold. The cost of treating a ton of ore is so great that ores of smaller gold content cannot be worked profitably. There will no doubt continue to be improvements in efficiency, but these are likely to be offset by exhaustion of the better grades of ore. The conclusion which seems conservative and sound is that little expansion of output is likely from lower grade ores.

The Prospect of Manufacturing Gold by Chemical Processes.—The ancient quest of alchemy for a method of transmuting gold from baser metals is familiar to every one. Chemists who have seriously studied the problem of transmutation from the vantage point of modern science have often been exposed to the scorn of their contemporaries. However, of late, developments have taken place which require honest and open-minded consideration. In 1924 Professor Adolphe Miethe of Charlottenberg Technical College, Germany, announced that quite by accident he had transmuted a minute portion of gold from mercury. The conditions of the experiment attracted scientific attention, and an attempt to reproduce the experiment was made by the Department of Physics at New York University. A report on the latter attempt published by the *Scientific American* is as follows: "The result of this investigation may now be announced. It is an entire failure to confirm the transmutation of mercury into gold, as announced by Professor Miethe."[1]

In the meantime a similar experiment has been announced from an entirely independent quarter. Professor H. Nagaoka, of the Institute of Physical and Chemical Research, Tokyo, using different methods, announced in 1925 that he had succeeded in transmuting gold from quicksilver.[2]

In the light of these developments, one can only assume a waiting attitude. It appears entirely possible, as a scientific achievement, that the transmutation should be performed. However, until the controversy between the scientists themselves is settled, the economist must content himself with an attitude of indecision.

This uncertainty need not materially affect the economic argument. Even if the chemical achievement is verified, synthetic gold would be so costly that it would have no effect whatever upon the commercial supply of that metal. It would cost many thousands of dollars to produce an ounce of pure gold, which would have a commercial value of only $20.67. The economic supply of the metal would, therefore, be unaffected by any such discovery.

Of course, there is the further possibility that, once science had discovered the secret of transmutation, further research would reveal a way of putting production on a commercially profitable basis. Of this possibility, we may note that it is purely an imaginary matter at present and that no known existing scientific work warrants an expectation that it will be realized during the proximate future.

Summary of the Prospects of Increased Gold Supply.—Neither by more intensive exploitation of present deposits of gold-bearing materials, nor by discovery of new mines, nor by chemical manufacture of gold, is there a bright prospect of increasing gold production above present levels. Although prediction in this field is somewhat precarious, nevertheless this position appears, from existing knowledge, to be reasonable and conservative, and the only sound assumption upon which to base calculations for the future.

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[1] *Scientific American*, November, 1925, p. 296. Dr. H. H. Sheldon of the Department of Physics at New York University, in a personal letter to the writer, March 25, 1927, declares: "I wish to assure you that there is no likelihood of any transmutation experiments that will upset the gold standard for the next hundred years in my estimation."

[2] *Nature*, July 18, 1925, p. 96. In a letter to the writer, March 14, 1927, Dr. Frederick Soddy of England has the following to say, relative to the experiments by Miethe and Nagaoka: "The opinion of the scientific world at present is strongly against their acceptance. Certainly very many attempts to repeat them have failed and the view is that the gold is an impurity in the original materials. My opinion of these particular experiments is rather in the same direction, that it is very doubtful if the gold is produced. That of course does not oppose the theoretical possibility that one day it may be achieved."

Stock of Gold Money and Stability of the Price Level.—Since the secular trend of the gold supply bears such an important relation to the secular trend of the price level, it should be possible to calculate a normal relationship between the two factors. Let us define a normal relationship as one which would tend to keep the price level fairly stable. It is a relationship which would avoid secular swings of inflation or deflation such as those which have occurred repeatedly during the past century and a half. It is a relationship which would mean that the stock of gold money is growing in proportion to the growing needs of trade and industry. Our inquiry at this point, therefore, is as follows: What normal rate of increase in the stock of gold money would be sufficient to preserve stability in the long-time trend of the price level?

Some very significant studies of this problem have recently been made. Gustav Cassel has estimated that from 1850 to 1910 the normal increase of gold stock would have been 2.8 per cent per annum. This is a compound rate of increase. Cassel made this calculation by observing that Sauerbeck's index of wholesale commodity prices in England was the same at three separate dates, namely, 1850, 1886, and 1910. Since England was both a free-trade country and a free gold market during this period, he assumes that English prices are representative of world prices. He finds that from 1850 to 1910 the increase in world stock of world gold amounted to a compound annual rate of increase of 2.79 per cent. He adds to this 0.2 per cent as an allowance for wastage and loss, and so reaches the final estimate that for the sixty years preceding the World War, an annual increase of 3 per cent in gold supply would have been the normal increment necessary to stabilize the long-time trend of the price level. His hypothesis is stated as follows: "An annual production of 3 per cent of the supply at any time is a condition for the maintenance of the general price level unchanged, so far as the gold supply is concerned."[1]

Joseph Kitchin, using closely similar methods of calculation, arrives at a conclusion substantially the same.[2] He takes two different series of years when prices were at uniform height, namely, 1851, 1884, 1907, and 1844, 1880, 1913. From each series he obtains the same result. During the half to three-quarters of a century preceding the World War, prices kept a horizontal level when gold money increased at the rate of about 3 per cent per annum. However, he adds one significant modification of the 3-per-cent estimate. This modification grows out of a comparison of the first half and the last half of each of these sets of years. The comparison shows the following results:

TABLE III

STOCK OF GOLD MONEY

(Increase per cent per annum, compound)

Set of Years When Prices Were at Same Height	First part of Period	Second part of Period	Amount by Which Second Part of Period Falls below First Part
1851–1884–1907	3.09	2.91	.18
1844–1880–1913	3.29	2.76	.53

In each set of years the normal rate of increase shows a slight slowing down in the later period. This suggests that the normal requirement has gradually been tapering down. During the middle of the nineteenth century, it was a little more than 3 per cent; whereas, during the latter part of the nineteenth and the opening quarter of the twentieth century, it was probably somewhat less than 3 per cent. The causes of this tapering down in the normal rate of increase will be considered later, but the inference itself seems to be verified by the records of the periods under observation.

Moreover, it should be borne in mind that these estimates are based upon pre-War conditions only. If the War has brought about fundamental changes in the gold standard, in the efficiency of gold, or in the demand for gold, such changes would require corresponding modification of an estimate of normal for the future. The possibility of changes of this character is discussed in the chapter following. At this point, however, it may be remarked that this later discussion leads to the view that the post-War gold requirement is an annual increase amounting to about 2.7 per cent of the existing monetary stock of the world.

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[1] *The Theory of Social Economy*, 1923, p. 451.

[2] See "Evidence Presented to the Royal Commission on Indian Currency and Finance," 1926, vol. III, Appendix 82.

Deviations from Normal and Fluctuations of the Price Level.—If we adopt as normal that rate of increase in gold supply which would result in stability of prices, we may infer that deviations from normal would bring about fluctuations in the price level. When the rate of increase in gold supply has been more than about 3 per cent, we should expect secular inflation of prices. When the rate has been less than 3 per cent, we should expect secular deflation. In order to test this inference, the following table has been prepared:

TABLE IV

COMPARISON OF GOLD INCREASES AND PRICE FLUCTUATIONS

Period	Average Annual Rate of Change in Wholesale Commodity Prices [a]		Interval, Number of Years	Compound Rate of Increase Per Annum in World's Stock of Gold Money	Difference between Actual Rate and Normal Rate
	United States	Great Britain			
1814–1850..	− 1.66	− 1.58	36	0.9	− 2.1
1850–1873..	+ 1.52 [b]	+ 1.91	23	4.2	+ 1.2
1873–1896..	− 1.65 [c]	− 1.95	23	1.9	− 1.1
1896–1914..	+ 2.55	+ 2.16	18	3.5	+ 0.8 [d]

[a] Indexes same as those used previously in the chart on page 235. If we take Carl Snyder's index of general prices based upon wholesale prices, wages, cost of living, and rents, we obtain for the United States for 1875–1896 an average annual decline of 0.62 per cent, and for 1896–1914 an average annual increase of 1.66 per cent. Although these degrees of change differ slightly from those obtained by using wholesale prices alone, nevertheless the direction of change agrees quite definitely in the two cases.

[b] Calculated from the prices adjusted for the gold premium.

[c] Index for 1873 taken on gold basis, *i.e.*, greenback prices adjusted for gold premium.

[d] For this period, normal has been assumed at 2.7, in accordance with the previously discussed tendency for normal to taper down.

This table shows that during the two periods of rising prices, gold increase was definitely above the normal rate; and during the two periods of falling prices, gold increase was definitely below the normal rate. Of course, this space of time is too brief to afford the basis for any claim that the theory of gold and price relationships is completely verified; nevertheless, it does offer strong presumptive evidence in that direction.[1]

The present chapter has been concerned with the supply of gold money. The following chapter will deal with the demand side of the equation.

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[1] Cassel offers some valuable data in verification of the foregoing conception of a normal rate of gold production. See his *Theory of Social Economy*, 1924, pp. 442–454. Further verification is presented by Lehfeldt, R. A., *Gold Prices and the Witwatersrand*, 1919, especially chs. I and II.

Chapter XIII

THE DEMAND FOR GOLD

Classification of Demand Factors.—The principal factors in the demand for gold which require analysis may be classified as follows:

I. Nonmonetary Factors
  (1) Consumption by the industrial arts
  (2) Consumption by the Orient

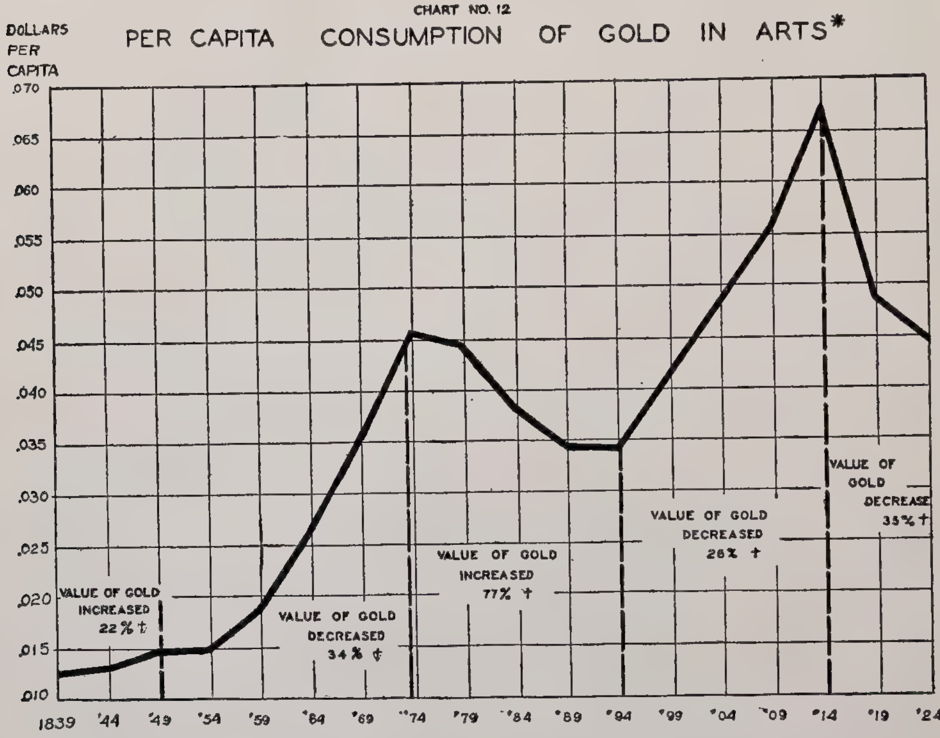
II. Monetary Factors
  (3) Withdrawal of gold from circulation
  (4) Expansion of notes and deposits on a given volume of reserves
  (5) Pooling of reserves under a gold exchange standard
  (6) New adoptions of the gold standard
  (7) Secular trend of population and of volume of trade

Consumption in the Industrial Arts.—The per capita demand for gold in the arts appears to follow two tendencies. The first tendency is for this demand to increase as the income and standard of living of the average man increase. As people gain larger incomes, they spend more freely on jewelry and ornament. This disposition has long been a familiar fact to the student of family budgeting. It in large measure accounts for the expenditure in the United States of $0.335 per capita for new gold in the arts in 1924, as compared with only $0.175 per capita in 1880.

The second tendency is for the demand in the arts to diminish when gold becomes dear. When the price level falls, the consumer must sacrifice a larger quantity of goods in order to obtain a given quantity of gold. This tendency is illustrated in the very slow increase or actual decline in this demand during the periods of falling prices from 1839 to 1849 and 1874 to 1894. The converse of this tendency is illustrated in the very rapid increase in the demand at two other periods, from 1854 to 1874 and from 1899 to 1914, when prices were rising. These movements are shown in the accompanying chart which portrays the world industrial consumption of gold per capita during various periods of change in the value of that metal.

Interwoven with these long-time changes in industrial consumption are short-time changes. The latter bear a close relationship to the business cycle. This fact is brought out by the chart on page 257. The straight lines show the secular trend of the demand in the arts in the United States at different periods. The curved line shows the actual consumption in the arts, fluctuating above and below the secular trend. In general, the low points on the curve coincide with periods of industrial depression, and the high points, with periods of industrial prosperity. Thus this demand appears to have a distinctly cyclical character. The world industrial consumption of new gold during the five-year period ending in 1914 attained the record annual figure of $117,-700,000. The volume shrank severely during the War and after.

CHART NO. 12


PER CAPITA CONSUMPTION OF GOLD IN ARTS*

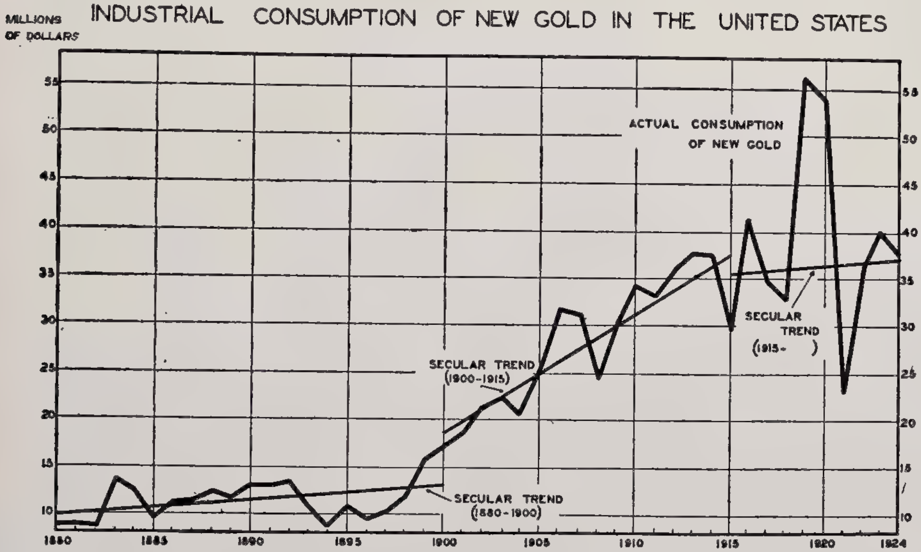
* Estimated according to the population of the world.

† The percentage of change in the purchasing power of money during the intervals separated by heavy vertical lines. The trend of consumption was rapidly upward when gold was becoming cheaper but slowed down when gold was becoming dearer.

The average annual consumption during the five years from 1920 to 1924 is estimated at only $84,600,000. This represents a decrease of $33,100,000 in annual world consumption. Undoubtedly the post-War rate has been far below normal. The cause lies chiefly in the post-War poverty of European nations. So far as the United States is concerned, there has been no severe slump in arts' demand. The United States used $37,900,000 of new gold in 1924, an amount practically equal to that used in 1913. Europe, on the other hand, used less than two-thirds as much industrial gold after the War as before. The slump in the demand in the arts has, therefore, been confined solely to European countries.

CHART NO. 13

INDUSTRIAL CONSUMPTION OF NEW GOLD IN THE UNITED STATES



The future world consumption may reasonably be expected to rise gradually to the pre-War level, and after a decade or so, to surpass it. If this view is correct, the tendency will be for world consumption to reach approximately $120,000,000 annually sometime between 1930 and 1935. If the price index should rise in the meantime, this process would be accelerated; if it should fall, the process would be retarded. The recovery may be punctuated by periods of industrial depression and consequent intermittent slumps in arts' demand, but the long-time trend should be substantially as outlined. This estimated future consumption represents a tremendous volume of new gold. It is about one-fourth of the new gold produced during the peak years of gold mining, and about one-third of the output during the post-War years. Because the industrial consumption is so great, it is a very important factor in determining the amount of gold which will be left in a form available as money. The demand in the arts takes gold out of the monetary channels, and tends to create a scarcity of specie for bank reserves and circulation.

Consumption of Gold by the Orient.—India absorbs large quantities of gold for nonmonetary purposes. The use of the metal is chiefly for ornament and hoarding.[1] China and Egypt absorb gold for similar reasons, but on a much smaller scale. The following chart shows that the trend of this demand of the Orient, in spite of many year-to-year variations, has been persistently upward. The rate of increase of this demand has been slowest during periods of rising value of gold and fastest during periods of falling value of gold. The people of India have imported gold in great quantities when it was cheap in terms of commodities, and have lessened their importation when gold was dear.

The pre-War and post-War absorption by the Orient are indicated by the following table:

TABLE I

ORIENT'S ABSORPTION OF GOLD

(Average Annual Consumption)

Period	India	China and Egypt	Total
1909–1914	$93,400,000	$5,800,000	$99,200,000
1919–1924	100,200,000	1,900,000	98,300,000
(Year to March 31 following)			
1924	254,000,000	8,000,000	246,000,000
1925	133,000,000[a]		
1926	125,000,000		
1927	69,857,000		

[a] Estimate by Kitchin.

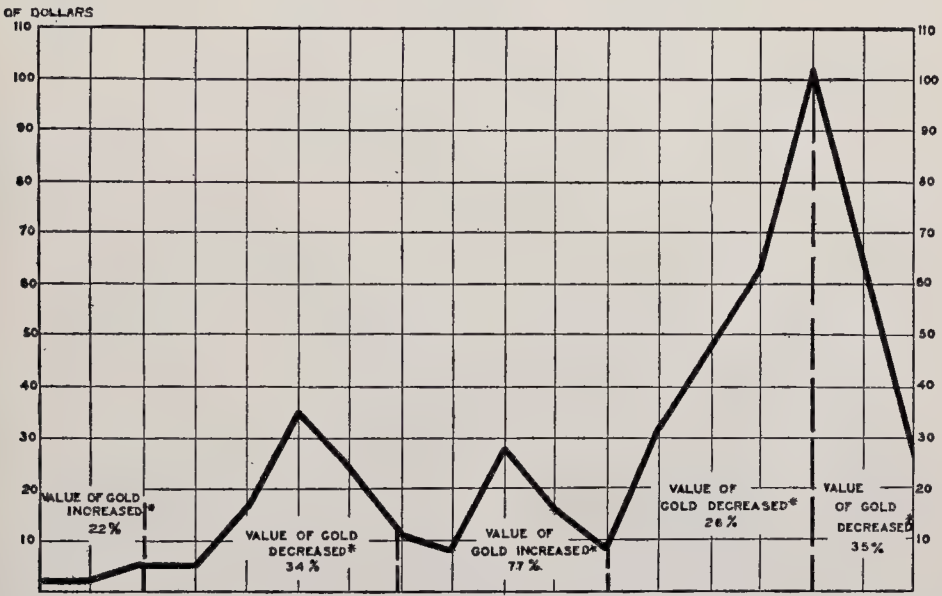
It seems conservative to expect the ordinary consumption of the Orient under present circumstances to equal at least $100,-

[1] The adoption of the gold exchange standard by India in 1927 may very gradually diminish the demand for hoarding purposes in that country, but the immediate result will be to add to the existing demand for hoarding a new demand for the purpose of accumulating bank stocks of gold.

000,000 annually. Consumption in certain post-War years was extraordinarily high, a condition which doubtless reflected a tendency to make up for a gold shortage in India created by War-time restrictions on gold imports. The 1925 figure was a reapproach toward more normal requirements. The requirements annually during the next decade are likely to average between $100,000,000 and $125,000,000.

CHART NO. 14

GOLD CONSUMPTION BY THE ORIENT

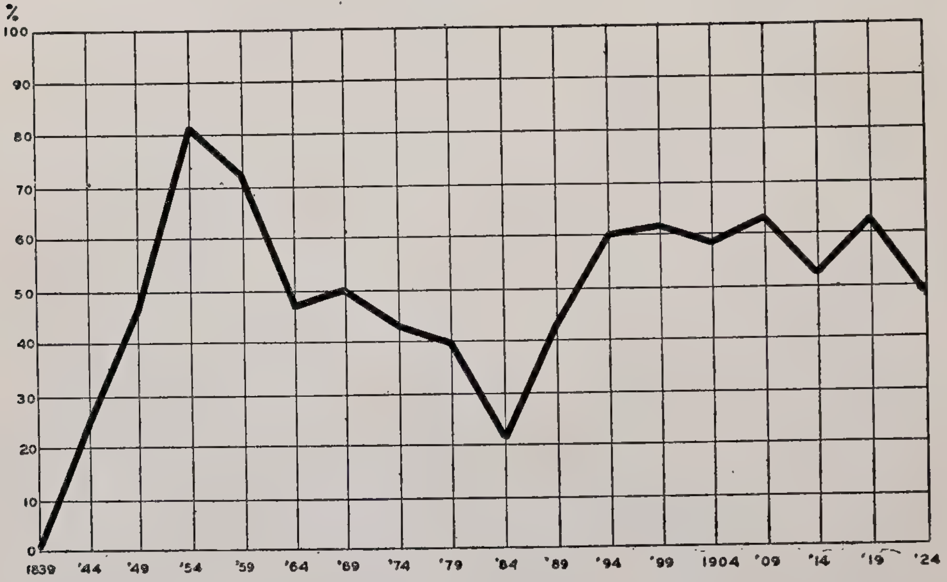


* The percentage of change in the purchasing power of money during the intervals separated by heavy vertical lines. The trend of consumption was rapidly upward when gold was becoming cheaper but slowed down when gold was becoming dearer.

The Amount of Gold Available as Money.—Gold available as money consists of the amount left after the demands of the industrial arts and of the Orient have been satisfied. During the five-year period, 1910-1914, 52.5 per cent of the total world output was available as money. During the five-year period, 1920-1924, only 47.5 per cent was available as money. The percentage available as money varies widely from period to period. The accompanying chart pictures these variations over an 85-year era. It is apparent that the proportion available as money rose sharply during the decades immediately following the great gold discoveries in California and Australia, and again during the decades immediately following the gold discoveries in South Africa. On the other hand, during periods of waning gold production, the proportion available as money dwindled rapidly. The arts demand and the demand of the Orient were inelastic. No matter what might happen to production, these nonmonetary demands must be satisfied. Consequently, the monetary share of the new production was the first to suffer during a period of slowing down in gold production, and the first to gain during a period of expansion of production. The share available as money after the World War was the lowest reached in any period since 1889.

CHART NO. 15

PER CENT OF NEW WORLD GOLD OUTPUT AVAILABLE AS MONEY



The previous sections have led to the estimate that in the near future we must expect the arts demand to be at least $120,000,000 and the Orient's demand at least $100,000,000. These two sources of demand combined may thus be estimated to require fully $220,000,000 annually of new gold. It is reasonable to expect that they will exhibit a tendency to increase rather than decrease. Hence, each year the gold mines must supply this huge sum to industry and the Orient before any new gold is available for money.

Withdrawal of Gold From Circulation.—During the World War, the attempt to economize gold led to a widespread withdrawal of gold from circulation and a concentration of the metal in bank reserves. When gold circulates as coin from hand to hand, it increases the supply of media of exchange only dollar for dollar. But when it serves as bank reserves, it may support many times its own volume in notes and deposits and thus add five or ten times its own volume to the total media of exchange. Hence, under the new conditions of gold usage, a given world stock of monetary gold would support a much higher price level than formerly, and a smaller annual increment in gold stock would serve to stabilize prices at a given level. The data of the following table afford a basis for estimating the extent of the change in gold usage and the importance of the change with respect to the forces determining the value of money.

TABLE II

RATIO OF GOLD IN CIRCULATION TO WORLD STOCK OF GOLD MONEY

Year	I In Circulation	II Total Monetary Gold	Per Cent: Column I of Column II
1903	$2,614,800,000	$5,685,700,000	46.0
1904	2,622,500,000	5,987,100,000	43.8
1905	3,014,200,000	6,483,500,000	46.5
1906	3,124,000,000	6,888,900,000	45.3
1907	3,029,100,000	7,014,600,000	43.2
1908	Data Incomplete		
1909	Data Incomplete		
1910	2,102,200,000	6,500,700,000	32.3
1911	Data Incomplete		
1912	3,042,400,000	8,480,700,000	35.9
1913	2,704,800,000 [a]	7,728,000,000 [a]	35.0
1914	1,427,497,000	7,111,308,000	20.1
1925	539,000,000 [a]	9,800,000,000 [a]	5.5

[a] Estimates based upon reports by United States Director of the Mint and by the Federal Reserve Board.

In European countries alone, it is estimated that $1,834,000,000 of gold which was in circulation in 1913 was centralized in reserves during the War. Consequently, although Europe exported $1,527,000,000 of gold between 1913 and 1925, at the end of the period her central bank reserves were actually $307,000,000 greater than at the beginning. The loss of gold from bank reserves by export was more than offset by the withdrawal of gold from circulation.

From the foregoing table, it is apparent that for many years before the War there had been a gradual decline in the proportion of gold in actual circulation. In 1913 slightly more than one-third of the world's stock of gold money was in circulation. The withdrawal of nearly all of this gold from circulation had the effect of a 50-per-cent increase in central bank reserves. Thus, if in 1913 all gold had been in reserves, the volume of such reserves would have been not $5,023,200,000, but $7,728,000,000. If notes and credits had been created at the then customary ratio, the total media of exchange would have been sufficient to support a price level about 35 per cent higher than the actual level which prevailed in 1913.[1]

In 1927, the world's stock of gold money was slightly in excess of $10,000,000,000. By virtue of the fact that this amount was almost wholly in central reserves, it would support a price level about 35 per cent higher than would have been possible if gold had been used for circulation purposes. It would do this without any lowering of reserve ratios. In other words, reserve ratios remaining the same, the 1927 world's stock of gold money would support a general price index of 135, solely because of the withdrawal of gold from hand-to-hand circulation.

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[1] For an explanation of the complex factors involved in arriving at this estimate, reference may be made to Chapter VI of a monograph by the writer on "Gold Production and Prices Before and After the World War," (1928), *Indiana University Studies*. The method of calculation may be illustrated briefly as follows: Let us assume that, taking gold standard countries in the aggregate, the ratio of gold to notes and demand deposits combined is 1 to 5. Then, in 1913, the total media of exchange not in central reserves would be 5 × $5,023,200,000 or $25,116,000,000, plus $2,704,800,000, the amount of gold in circulation—a total of $27,820,800,000. If, however, all gold had been in central reserves, the total media of exchange not in such reserves would have been 5 × $7,728,000,000 or $38,640,000,000. Of this new total, $2,704,800,000 would have been currency substituted for the gold withdrawn from circulation. The new total is about 38 per cent in excess of the total as first calculated, although the central gold reserves are about 53 per cent greater in the second case than in the first. The discrepancy between the 38 per cent increase of total media and the 53 per cent increase of central reserves arises from the allowance that has to be made in the first case for gold in circulation and in the second case for that part of the currency which is merely a substitute for the gold withdrawn from circulation.

The 35 per cent estimate presented in the text above is to be taken only as a rough approximation. The right figure may be as low as 30 per cent or as high as 40 per cent, depending upon the assumptions made in the process of calculation, but probably falls safely within the range of these upper and lower limits. The chief assumption which affects the results is the 5 to 1 ratio between media of exchange and central gold reserves. If a ratio higher than 5 to 1 be assumed, the resulting per cent would be above 35; if a ratio lower than 5 to 1 be assumed, the resulting per cent would be under 35. Such sparse statistical data as are available suggest that the 5 to 1 estimate is fairly close to reality.

The new form of gold usage greatly enhances the efficiency not only of the existing stock of gold but also of the new gold output of the world each year. Under the old conditions, the normal annual gold output necessary to stabilize the price level would be about 2.7 per cent of the existing stock of gold money. Under the new conditions, the normal annual output is still 2.7 per cent, but this per cent is adequate to stabilize prices at a level 35 per cent higher than would be possible under pre-War habits of gold usage. In brief, an annual gold increment of 2.7 per cent of existing stock will now hold prices up to an index of 135 (1913 = 100), whereas under former usage, it would have held prices up only to an index of 100.

It may be asked: Will the revolution in gold usage prove to be permanent? There are impressive reasons for believing it will be.

The United States has demonstrated that gold circulation, although allowable, is in fact largely a custom of the past. European countries have accustomed themselves since 1913 to paper notes and light coin. It is quite unlikely that they will ever resume on a substantial scale the inconvenience of carrying gold coin for retail purchases. A permanent revolution of monetary habits has taken place, whereby gold does its work in reserves rather than in circulation. Consequently, it makes little or no difference whether the countries of the world again *permit* gold to go back into circulation. If the gold will not *as a matter of fact* be used in circulation, the permission so to use it is wholly superfluous.[1] If these assumptions are valid, more than $3,000,000,000 of existing gold which, under pre-War conditions, would have been in circulation, will continue to be centralized in bank reserves.

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[1] The opinion of Professor T. E. Gregory on this point is of interest. "I do not believe that the populations of countries like England and the United States will go back to the use of gold coin. Some of those countries [Continental Europe] at any rate, even in pre-War days, although they had the opportunity of acquiring gold coin on demand, did not in fact use it. The most striking case, of course, is Austria, where the Austrian National Bank tried in fact to put gold coin into circulation and found that people preferred Austro-Hungarian bank notes." Professor Gregory seems to believe, however, that the privilege of coin circulation should be reestablished, even though negligible advantage is taken of it. See *Royal Commission on Indian Currency and Finance*, 1926, vol. V, p. 138, and vol. III, Appendix 80.

Expansion of Notes and Deposits on a Given Volume of Reserves.—As reserve ratios fall, less gold is needed to support a given price level. Economy in reserve requirements lessens the demand for gold at any given price level. Such an economy had been in progress before the World War, and made important advance during the War. The following table shows this form of economy for England and the United States. The same tendency prevailed in varying forms in many other gold standard countries.

TABLE III

THE DECLINE OF GOLD RESERVE REQUIREMENTS, 1882–1913

Year	Stock of Gold in the United States Expressed as a Per Cent of Individual Deposits of all Banks plus Stock of Currency	Gold Held by Bank of England Expressed as Per Cent of Notes and Deposits Combined
1882	12.1	40.9
1913	9.8	34.6
1925	8.6	23.8

The tendency apparent in England and the United States prevailed in varying degrees in other gold standard countries. As a result, the efficiency of each dollar of gold as a basis for credit structure probably increased more than one-fifth during the thirty years ending 1913.

Under this condition of the increasing efficiency of gold, the annual world requirement of new gold was, as previously estimated, approximately a 2.7-per-cent yearly increment to the existing world stock. If, after 1913, reserve ratios were to show a continued decline, the estimate of 2.7 per cent as the normal annual requirement would continue unchanged. In other words, this estimate of a normal annual requirement rests upon the assumption that the reserve percentages will continue to fall gradually in the future as in the past.

In spite of many differences in reserve ratios between countries in the pre-War period, the trends of commodity price levels in gold standard countries were remarkably uniform. Differences in reserve ratios became extraordinarily sharp during the War and post-War period, but the trends of commodity price levels in gold standard countries still exhibited marked uniformity. The following table illustrates this fact in certain countries for the period since 1913.

TABLE IV

Country	Gold Reserve of Central Bank as Per Cent of Notes Plus Central Bank Deposits		Price Index (1913 = 100)	
	1913	1925	Dec. 1925	Dec. 1926
United States	9.8 [a]	8.6 [a]	156	147
Switzerland	51.3	50.3	157	148
United Kingdom	43.5	23.8	153	146
Denmark	96.7	44.5	160	145
Netherlands	47.0	46.8	155	146
Sweden (1915)	32.1	28.5	156	150

[a] Nation's stock of gold as per cent of notes plus individual deposits, all banks.

It will be noticed that at the end of 1926, the wholesale commodity price indexes of these six countries clustered within a range of 145 to 150 (1913 = 100). This level was approximately the average of all countries which at that date had returned to gold, and may be considered as substantially the post-War level of world gold prices. To what extent is the new price level due to lowered reserve ratios? It should be recalled that earlier in the present chapter, evidence was presented to show that purely as a result of withdrawal of gold from circulation, the world's stock of gold money would be approximately sufficient to maintain a post-War price level of 135, *reserve ratios remaining the same as in 1913.* The fact that the actual post-War wholesale price index has been about 145 to 150 suggests that the difference between these indexes and 135 is due chiefly to lowered reserve ratios. In the aggregate, the effect of lower reserve requirements was to raise the wholesale price index 10 to 15 points above what it otherwise would have been.

The foregoing factual data may be clarified and interpreted by summarizing certain general inferences which have bearing upon the present problem, namely, the effect of changes in reserve ratios upon the demand for gold:

1. Reserve percentages had been gradually declining prior to 1913, and this decline continued at a pace somewhat more rapid during the War period.

2. Degrees of change in reserve ratios before the War differed widely from one gold-using country to another, but this fact did not prevent gold-using countries from maintaining an approximately uniform gold price level.

3. Sharp differences between countries with respect to reserve ratios prevailed during and after the War, but the post-War price level in gold-using countries appears to have settled at the approximately uniform index of 145 to 150 (1913 = 100).

4. A price index of 135 would be warranted by the withdrawal of gold from circulation if no changes in reserve ratios had been made. The difference between an index of 135 and one of 145 to 150 is in part accounted for by the aggregate effect of new reserve ratios in gold-using countries.

5. New reserve ratios do not alter for the present the 2.7 per cent estimate of normal annual requirement of increased gold supply, but gradually over a quarter of a century may pull the requirement down. This tapering down of the annual rate of increase in gold stock would be a continuation of a similar process in evidence before the World War.

Pooling Reserves Under a Gold Exchange Standard.—Many countries have demonstrated the possibility of obtaining the basic advantage of a gold standard even though gold reserves are in part or entirely deposited in a foreign bank. In that case the currency of the country is convertible into drafts drawn upon liquid credits abroad or actual deposits of gold bullion in foreign banks. This indirect provision for convertibility has proved effective in maintaining a parity between the value of domestic currency and the value of gold. It effectively ties the country's price level to the world gold price level. By accepting gold in the foreign bank or credits convertible on demand into foreign gold as part of its reserves, a country practically pools its gold reserve with the gold reserve of the foreign country. In other words, it enables the same gold to function as reserves for two different countries at the same time. Obviously this results in a great economy in the use of gold, and means that on a given supply of gold a much greater superstructure of currency and credit can be erected.

That this arrangement is sufficiently extensive to have deep significance is indicated by the data of the following table, showing for a few countries the distribution of reserves at home and abroad:[1]

TABLE V

GOLD RESERVES AT HOME AND ABROAD, JANUARY, 1927

Central Bank	Distribution of Reserve	
Bank of France	Gold reserve at home	3,684
(millions of francs)	Gold, silver and foreign exchange	1,684
German Reichsbank	Gold at home	1,706
(millions of reichsmarks)	Gold abroad	128
	Reserves in foreign exchange	421
Bank of Japan	Gold at home and abroad	1,058
(millions of yens)		
Austrian National Bank	Gold	53
(millions of schillings)	Foreign bills of the reserve	479
National Bank of Belgium	Gold	3,108
(millions of francs)	Foreign bills	2,114
Central Bank of Chile	Gold at home	85
(millions of pesos)	Gold abroad	562

The reserve deposited abroad need not be entirely in the form of specie. It may be mainly or wholly in the form of foreign bills, securities, and balances which can readily be liquidated in gold. At the end of March, 1927, the aggregate of such liquid foreign assets of thirty central banks was about $1,600,000,000.[2] Of this amount, about $1,000,000,000 was held in the United States to the account of various foreign central banks. New York and London have acted as the main centers for this process of pooling reserves during the post-War period.

Impressed by these developments, some authorities have proposed that all countries agree by an international compact to place their gold reserves in the hands of bankers in London and New York. These financial centers, so it is proposed, would hold the gold of the world in trust and disperse it only as occasion demanded for the stabilization of exchange rates and the maintenance of a proper balance between the price levels of the leading countries. Such an international agreement, if it could be achieved, would, as a matter of fact, accomplish great economy in the use of gold. It would enable a given volume of reserves to support a much higher price level than would be possible if each country insisted on its independent reserve of gold. In the event of a world shortage of gold production, this economy might conceivably be used to offset entirely such a shortage and to prevent a rise in the value of gold.

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[1] Reports of Central Banks, *Federal Reserve Bulletin*, March, 1927, pp. 205–206.

[2] *Federal Reserve Bulletin*, June, 1927, p. 392, and September, 1927, p. 37. There is some slight offset to these United States holdings because of gold or credits held abroad to the account of the Federal Reserve Banks.

Although such economy by pooling of reserves is theoretically possible, and probably financially desirable, the obstacles to its realization are great. The most serious obstacle appears to be the sense of nationalism. Each country feels the need of a domestic gold reserve which it may manage independently, and upon which it may rely absolutely for its own use in time of war as well as of peace.

Those countries which are now on the gold exchange standard have resolutely set their faces in the direction of accumulating their own gold reserve at home and of limiting foreign liquid assets to certain specific needs of a temporary character. Smaller and weaker countries may for a long time rely upon a foreign reserve, but the stronger industrial countries which cherish their financial prestige demand an independent gold reserve. Gold disarmament is no less difficult to achieve than military disarmament. The degree of pooling which has already been realized can easily be overemphasized. Most countries appear to look upon the arrangement as a makeshift to tide them over until they are able to stand on their own feet financially. At the most, the pooling thus far achieved is a very mild form of gold economy and cannot account for more than 5 to 10 points in the index of general prices. Consequently, it is necessary to raise a serious question as to whether the pooling of reserves is either highly significant or reasonably permanent as a form of economy in the demand for gold.

New Adoptions of the Gold Standard.—In 1913, nearly all countries except China had in some form or other linked their monetary standards with gold. Consequently, the possibility of absolutely new adoptions of the gold standard is very narrowly limited. However, a great many countries have had such a loose form of gold exchange standard that their accumulation of specie has been very slight. There is a strong possibility that such countries will model their monetary standards after the pattern set by the leading gold centers—will attempt, in other words, to grow up to the complete gold standard.

Monetary evolution in such a direction would increase the demand for gold. There are countries, such as India, which have at some time been on a gold exchange standard, requiring very little gold, but which are now resolving to go onto a more advanced standard requiring gradual but substantial accumulation of gold reserves. There are countries, such as Russia, which have lost nearly all their gold reserves since 1913 but which may endeavor in the future to reaccumulate such reserves. There are countries, such as Czechoslovakia, which are newly created political units and whose banking systems make a new demand upon the world's supply of gold. There are countries such as Japan which, by the fortuitous events of the World War, suddenly acquired large stocks of gold and now desire to retain the bulk of such acquisitions.

The case of India is of special significance because of the enormous potential demand of that country for gold. India's population of 247,000,000 people, even under present industrial conditions, would require some hundreds of millions of dollars of gold as a basis for a full gold standard. According to a plan presented to the Royal Commission on Indian Currency and Finance in 1925, it was proposed that India return first to a gold exchange standard with the eventual intention of attaining a gold circulation standard. It was assumed that about $70,000,000 of gold would be required in India at the initiation of the plan, a further $170,000,000 within a year, and an additional $260,000,000 spread over a period of ten years. The total ten-year gold requirement would, therefore, be about $500,000,000.

It was feared that so heavy a drain on the world's gold supply would disturb world finance. Accordingly, India modified her requirements and in March, 1927, created a gold exchange standard, whereby the proper government officials are given the option of furnishing foreign gold exchange instead of gold whenever they deem such action desirable.

What effect will a gradual growing up to the gold standard by many countries have upon world demand for gold? The precedent to be found in the period between 1871 and 1890 when fourteen important countries attempted to establish a gold standard, affords some basis for an answer. At that time, there was a new demand for gold which contributed to some degree to appreciation of gold and falling prices. But the degree to which this factor was responsible for falling prices has commonly been exaggerated. Each country drew upon the stock of other countries and thus caused a redistribution of specie without, however, causing a very great net increase in the aggregate gold requirement. The most fundamental financial lesson taught by the experience of that period is that the adoption of the gold standard by new countries, while constituting some addition to demand, does not augment demand in proportion to the amount of new gold reserves required by the individual countries. The shifting of reserves from one country to another enables new countries to adopt the standard without correspondingly adding to the aggregate gold reserves of the world. Old gold-standard countries tend to economize in the use of specie, and thereby release some of their store of the metal for countries newly entering upon the gold standard. This conclusion has been rather widely accepted by economists who have given close study to the period from 1870 to 1896,[1] and it affords a caution against the frequent assumption of the present period that an abrupt new demand for gold is in prospect.

The question: What effect will growing up to the gold standard have upon world demand for gold? further involves a consideration of the saturation point in gold demand. The per capita stock of monetary gold in the United States in 1925 was $39.33. If the world were to demand the same per-capita stock, more than $66,000,000,000 of specie would be required. Great Britain's per-capita stock in 1925 was less than one-half that of the United States. If the world population, exclusive of India and China, were to be stocked at the rate prevailing in Great Britain, the total requirement would be about $15,000,000,000, or an amount 50 per cent in excess of the actual monetary stock of this portion of the world. It has been necessary to build up this conclusion in order that we may determine whether the estimate of normal secular trend at 2.7 per cent annual increase in gold supply is valid for the future. If the world were at the saturation point, then we might expect that the future would not be governed by the growth factor in demand which prevailed before the War. We would expect a fall in the normal rate below 2.7 per cent. But the survey of evidence clearly shows that, in fact, the world has by no means reached the saturation point in gold demand and that demand is not tapering off. Consequently, it is reasonable to assume that the 2.7 per cent estimate of normal increase will be valid for the proximate future. Thus, it may be concluded that new adoptions of the gold standard promise neither an abrupt increase in demand nor an extraordinary slowing down of demand.

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[1] See, for instance CASSEL, GUSTAV, *A Theory of Social Economy*, 1924, pp. 467–473.

The Secular Trend of Population and Volume of Trade.—The problem of determining whether there are changes in the secular trend of trade and population which alter the secular trend of demand for gold since 1913 involves reference to complex statistical data. Space limitations prevent the introduction of such data here. They are briefly presented in a separate study by the writer,[1] and afford a basis for the following summary of conclusions.

Wide differences have prevailed between countries in rates of increase of trade and population, but in the aggregate, world trade and population showed a remarkably constant secular rate of growth before the War. Under this condition a 2.7-per-cent annual increase in the world's stock of gold money was required to secure approximate stability in the value of money.

The World War caused a temporary halt in the growth of productive capacity in Europe, but it did not materially alter the pre-War rate of growth of productive capacity for the rest of the world. The temporary slowing down of European growth requires an estimate of 2.0 per cent as the annual world gold requirement from 1913 to 1925.

The secular trend of trade after about 1925 was in the nature of a return to the rate of growth, 2.7 per cent per annum, which prevailed before the War.

A falling off in population growth in some parts of the world has been offset by an increase in other parts, with the result that world population continues to increase with remarkable steadiness at a rate of about 0.8 to 1.0 per cent per annum. Any new decline in the rate of population increase must be expected to be so gradual that it would not materially alter the rate of growth during the next two decades.

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[1] *Gold Production and Prices Before and After the World War*, 1928, ch. X. See also CASSEL, GUSTAV, *Theory of Social Economy*, 1924, pp. 464–467, Appendix III; FISHER, IRVING, *Purchasing Power of Money*, 1911, pp. 290–292, 478–486; LEHFELDT, R. A., *Gold Prices and the Witwatersrand*, 1917, ch. II; ROSS, E. A. *Standing Room Only*, 1928, pp. 100–103.

Consequently, there is nothing in trade or population growth which substantially alters the estimate that an annual increase of 2.7 per cent in the world's supply of gold money will be needed in the proximate future in order to stabilize the long-time trend of prices.

Estimated Normal Supply Compared with Actual.—We may now proceed to apply the assumptions as to probable changes in the demand and supply of gold to the gold situation of the post-War period. Actual gold stock and current production may be compared with the estimated normal requirement. In this way, it is possible to ascertain whether a shortage of gold is in sight, and whether the value of gold is likely to appreciate or depreciate. The following table and chart compare the estimated normal stock of gold money with the actual. The estimated normal is computed by carrying forward to 1925 the actual stock of 1913 at the rate of an annual increment of 2.0 per cent and thereafter projecting it at the rate of an annual increment of 2.7 per cent.

In the accompanying table three separate estimates are presented of the actual world stock of gold money. A word of explanation is necessary in order to appraise the relative accuracy of these estimates. The first column contains an estimate by the United States Director of the Mint. It is based upon reports obtained from all important gold-using countries. Although the reports are carefully compiled, a study of the records of past years leads one to infer that the reporting countries do not always observe uniform methods of filling out reports. In addition to non-uniformity, there is a degree of incompleteness in the records; some countries are not represented at all. Consequently it is probable that the estimate for 1925 is slightly below the true figure.

The second column contains estimates published by the Federal Reserve Board based upon reports of the central banks of leading countries. These estimates are incomplete. The countries which are omitted are small, but in the aggregate they would add perceptibly to the total. Moreover, the figures purport to cover only gold in reserves. Of course, very little gold is now in circulation anywhere in the world in the form of coin, but the amount would make a slight addition to the estimates offered by the Federal Reserve Board. Consequently we may safely assume that the 1925 estimate is somewhat below the actual figure.

TABLE VI

WORLD'S STOCK OF MONETARY GOLD

(000,000 omitted)

Year	I United States Director of the Mint	II Federal Reserve Board (Estimates of Central Bank Reserves)	III Joseph Kitchin [a]	IV Normal Stock (2.0 Per Cent from 1913 to 1925; 2.7 Per Cent from 1925 to 1935)	V Normal Annual Increase Required
1913....	7,728	5,421	7,726	7,728	151
1914....	7,111	5,921	8,059	7,882	154
1915....	8,258	6,862	8,448	8,040	157
1916....	[b]	7,191	8,779	8,201	161
1917....	[b]	7,642	9,013	8,365	164
1918....	8,339	7,225	9,329	8,532	167
1919....	7,873	6,978	9,392	8,703	171
1920....	8,246	7,671	9,621	8,877	174
1921....	8,680	8,425	9,884	9,055	178
1922....	8,925	8,771	9,986	9,236	181
1923....	9,408	9,000	10,166	9,420	184
1924....	9,699	9,381	10,220	9,609	189
1925....	9,800	9,343	10,399	9,801	192
1930....	10,700 [c]		11,217 [d]	11,197	231
1935....	11,400 [c]		11,801 [d]	12,793	235

[a] See *Report of Royal Commission on Indian Currency and Finance*, 1926, vol. III, p. 534.

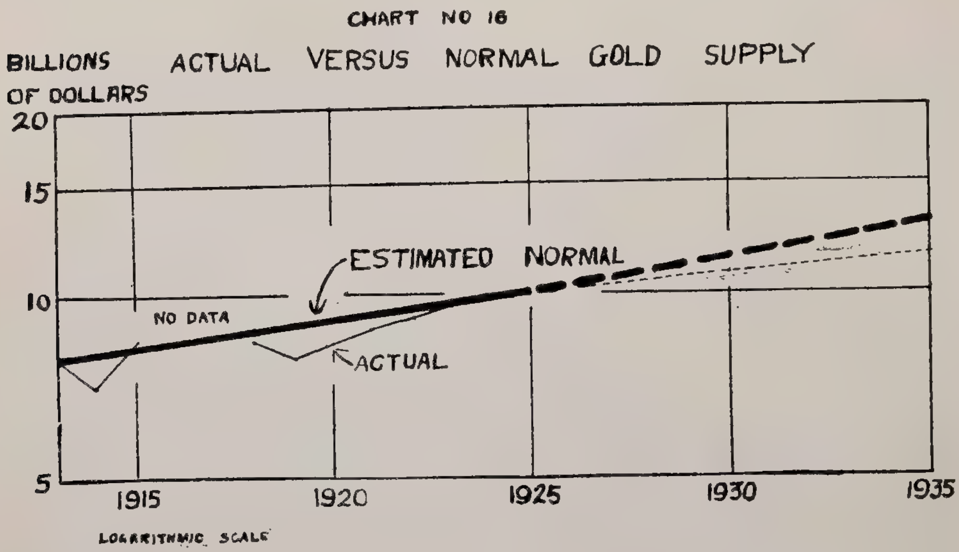
[b] Data not available.

[c] Preliminary estimates by the writer. These are believed to be maximum figures rather than minimum.

[d] Preliminary estimates by Kitchin.

The estimates by Joseph Kitchin contained in column III are arrived at by carrying forward the actual figures of earlier years, by adding thereto the current world output of gold for succeeding years less the gold consumed in the industrial arts and absorbed by the Orient. These estimates involve certain arbitrary assumptions and probably result in a slight overestimate of the actual stock for the year 1925. It is the belief of the present writer that an estimate of about $9,800,000,000 would approximate the true figure. This amount is almost identical with the estimated normal stock required by the 2-per-cent rate of increase, namely $9,801,000,000.

As indicated by the accompanying table and by chart number sixteen, the estimates have been projected at 5-year intervals to 1935. Sometime between 1930 and 1935 a deficiency of actual stock below normal would be expected to exert an influence upon the value of gold. This deficiency would each year become progressively greater. The reason for a growing discrepancy would be that the 2-per-cent rate is each year being applied to a larger base number. For instance, 2 per cent of $12,000,000,000 is considerably more than 2 per cent of $10,000,000,000. The amount of production can scarcely be expected to increase at such a progressive rate. Owing to exhaustion of deposits and the application of the law of diminishing returns, future production is more likely to decline than to increase. The following chart shows the trend of actual production since 1900 for principal gold mining regions and for the entire world.



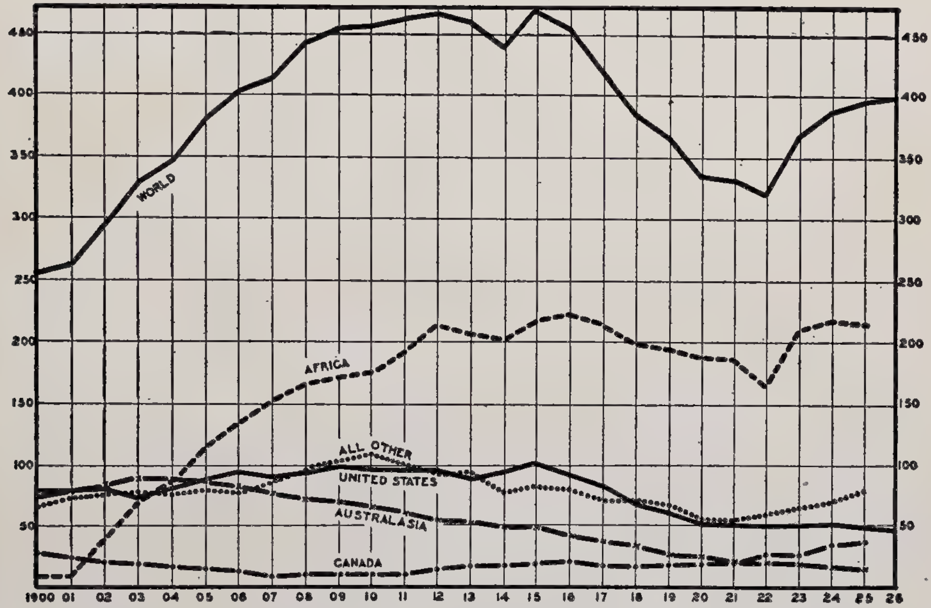
As a discrepancy between actual and required production becomes of material proportions, it will tend to cause a secular decline of the price level in all gold standard countries. We may with good reason assume that no serious long-time deflation of the price level in gold standard countries is imminent until after about 1935. But after that time, barring some fortuitous event, it is not unlikely that there will set in a gradual lowering of the price level over a long period of years.

Correction of Some Widely Accepted Assumptions.—Probably the most widely accepted assumptions relative to the value of gold in the post-War period have been as follows: (1) that the size of the existing stock of gold necessitates a gradual return to the pre-War price level of 100, (2) that since 1913 the annual requirement of new gold money is about 3.0 per cent, (3) that, quite independently of War influences, a shortage of gold below normal requirements set in about 1920, (4) that post-War changes in the gold standard may have taken place, such as to cause some extraordinary economies in gold usage and so to upset all previous calculations of demand.

CHART NO 17

GOLD PRODUCTION SINCE 1900.

(MILLIONS OF DOLLARS)



The present analysis warrants important corrections in all of these assumptions. The common expectation of return to a pre-War level does not take into account the fact that, had the 1913 stock of gold money been almost wholly concentrated in reserves, the price level of that year would have been 35 per cent higher than it actually was under the old usage of gold. By the same logic, today's stock of gold money is adequate to support a price index of 135 (1913 = 100), because of the withdrawal of gold from circulation. Hence, so far as existing gold stock is concerned, a post-War index of 135 is equivalent to a pre-War index of 100.

The second assumption, namely, that the annual requirement of new gold money is about 2.7 per cent annually, fails to specify at what level or index such a current rate of gold production might be expected to stabilize prices. Is it at an index of 135 or of 100 (1913 = 100)? Since the world is actually on the higher price level, the higher index must be selected as the point at which gold prices should be anchored. In brief, the same rate of increase, 2.7, should now be sufficient to sustain prices at a stable level 35 per cent higher than the pre-War level. Moreover, during the period 1913 to 1925, the normal annual requirement should be set at 2.0 instead of 2.7.

The third assumption, namely, that a shortage of gold below normal requirements set in about 1920, is fallacious. The notion originated with investigators who carried forward the estimates of normal requirements by applying a 2.7- or 3.0-per-cent annual rate of increase during a period which was quite abnormal. The rate which should have been used during the War era is not more than 2.0 per cent. When the correct per cent is applied, the estimated gold shortage is still imminent, but the time when it becomes effective is postponed a few years. Unless quite unexpected new sources of gold are discovered, it seems quite possible that the beginnings of a world gold shortage and a long-time fall of prices should be major issues by 1935.

The fourth assumption relative to economies in the demand for gold has arisen from a failure to analyze the changes in question. An air of mystery has surrounded the matter. A notion that financial practices have been violently upset and that they have not yet settled down in permanent or normal form has prevailed. A feeling that any attempt to analyze the situation must inevitably be futile has been allowed to paralyze research. In the absence of specific analysis, most authorities have made estimates on the assumption that gold usage will return to the pre-War form, but have warned that such an assumption is dangerous.

The present inquiry has been aimed at the unknown factors in this situation. The changes in the gold standard which might bring about an economy of gold prove, upon analysis, to be twofold: the withdrawal of gold from circulation, and the pooling of reserves under a gold exchange standard. The former is fully taken into account by the discovery that the existing stock of gold is adequate to sustain a price level of 135, and that a current rate of gold increase of 2.7 per cent is adequate to stabilize such a level against long-time fluctuations. The latter is found to be in large measure a temporary arrangement, but, in so far as it is permanent, an arrangement having very limited influence over the price level. At the most, both the withdrawal of gold from circulation and the pooling of reserves do not account for more than 10 to 15 points in the post-War wholesale index of gold standard countries.

Thus, by quantitative estimates, we find that the gold exchange standard gives rise to an enhanced efficiency in gold usage in the sense that withdrawal of gold from circulation would warrant a price index of about 135, and international pooling of reserves or lowering of reserve ratios would account for anything over that index.

However, the efficiencies in gold usage which account for the post-War price level do not permit any let-up in the yearly production of new gold. If all such efficiencies prove to be permanent, there still remains the necessity of an increase in world monetary gold stock of about 2.7 per cent per annum. That this view is sound will be apparent as soon as one examines the true nature of the alleged economies in use of gold. New efficiency in gold usage may do one of two things: first, it may give higher prices on the same gold supply; or, second, it may give the same prices on a reduced gold supply. Our post-War gold exchange standards do the former almost exclusively. They support a high price level by maintaining an extraordinary superstructure of credit on a base of centralized and pooled gold reserves. Under these conditions, all that the new economies in gold usage have led to has been the luxury, if it be a luxury, of a wholesale price index about 50 per cent above the pre-War level and a cost of living index about 70 per cent above. The economies have not led to any lessening of gold production requirements. Gold must be extracted from the mines in fully as large volume to support these high price levels, even with all the economies which have been introduced, as would have been necessary to support a 1913 price level, if none of these economies had come to pass. Gold efficiency has diminished the value of gold, but has not diminished the required production of gold. It has made possible a higher price level, but not a lower gold supply. Consequently, in a fundamental sense, the so-called economies of gold are not economies at all. They do not reduce in the least the annual gold requirement, estimated at 2.7 per cent of existing stock, necessary to avert a long-time decline of prices.

The Outlook for Gold.—The gold standard has been under trial for more than a century. The World War destroyed it in most countries temporarily; but after the War, all countries determined to return to some form of gold standard as rapidly as possible. The vitality and tenacity of the gold standard has been demonstrated in a remarkable way.

Nevertheless, more than ever before, the nations of the world are aware of the imperfections of gold as the unit of value. They are aware that reasonable stability in the standard of value is of the utmost importance, but that the gold standard as such provides no assurance of the stability desired. The present quantitative analysis of gold points to the occurrence of serious fluctuations in the secular trend of prices in the future as in the past.

The literature of monetary economics already abounds with schemes and plans to control the value of money. It is quite possible that this discussion will gradually bring public opinion to a point where it will support the principle of an adequately managed gold standard. Then, by manipulation of the discount rates of central banks, or by international regulation of the amount of metal produced in the gold fields, or by applying the principle of the compensated dollar, or by some other device, the value of money may be stabilized. Such an eventuality is possible, but it confronts tremendous obstacles during the next two or three decades. The prospect which confronts the financial world for the proximate future is a gold standard subject to the fluctuations of demand and supply of gold and to the disturbances of severe secular variations in the purchasing power of money.

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Chapter XIV

WAR AND PRICES

Introduction.—Not all wars have involved price inflation. The Crimean War was accompanied by a slight fall in prices, and the Franco-German War by a moderate rise, followed in the post-war period by a business boom and price advance culminating in the crisis of 1873. In the Boer War, prices in England at first rose about 10 per cent, but declined to the pre-war level before the war had ended. In the Russo-Japanese War, a very mild rise in prices occurred. However, when we trace the record of wars which have imposed prolonged and extremely heavy burdens of expenditure upon the countries concerned, we find a repeated story of drastic inflation and violent price increase. Most of the following discussion will be concerned with the World War, but as background, consideration will be given to the Revolutionary Wars in France and in the United States, the Napoleonic Wars as they influenced England, and the Civil War in the United States. For convenience, three phases of the war process will be dealt with:

1. Inflation during hostilities
2. Instability of prices after war
3. The recovery of price stability

Inflation During Hostilities.—At the date of the Armistice, November, 1918, the wholesale price indexes of a list of representative countries stood as follows:

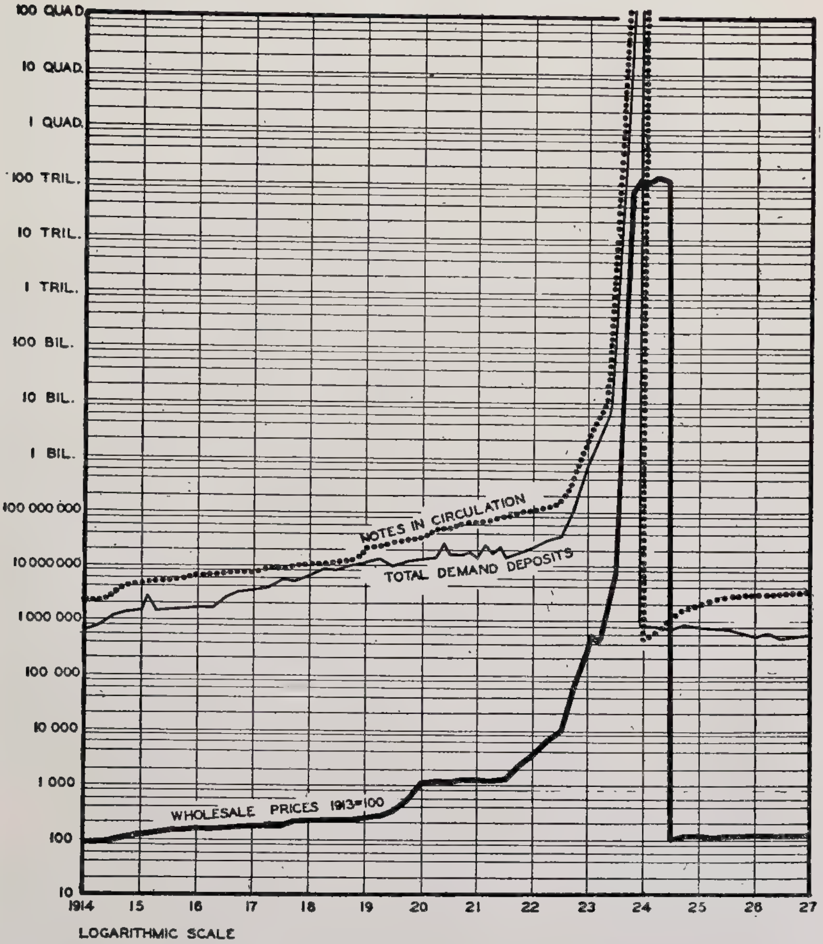
TABLE I

Country	Wholesale Price Index in November, 1918 (1913 = 100)
Great Britain	229
United States	203
France	358
Italy	437
Germany	234

The rise of prices is shown graphically by the accompanying charts for Germany[1] and France,[2] and by charts on pages 364 and 159 for England and the United States respectively.

CHART NO. 18

CURRENCY, CREDIT, AND PRICES IN GERMANY 1914-1927



The increase of prices was world-wide in scope and affected neutrals as well as belligerents. The wholesale index in the United States was 162 (1913 = 100) before this country declared war.

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[1] Notes in circulation and deposits are given in paper marks. The notes in circulation in December, 1923, amounted to about 500 quintillions of paper marks. The drop of prices and circulation in 1924 represents the new system of accounting in gold reichsmarks. Demand deposits and notes are according to reports of the German Reichsbank and do not include other forms of money and credit. For further explanation of data see YOUNG, J. P., *European Currency and Finance*, 1925, vol. I, pp. 528–238.

[2] For sources of data see YOUNG, J. P., *op. cit.*, pp. 470–480.

In Denmark, the 1918 average was 304; in Norway, 345; in the Netherlands, 373.

The movement of prices during the World War may be compared with that in England during the Napoleonic Wars and in the United States during the Civil War. The index of English wholesale prices at the middle of 1814 was 211 (1790 = 100);[1] the index of United States wholesale prices was 216 in January, 1865 (1860 = 100).[2] It is evident that the price increase of these previous wars was practically the same as that of the World War in England, Germany and the United States, but much less than that of the World War in such countries as France and Italy. After the World War, prices continued to rise in all countries, whereas after the Napoleonic and Civil Wars, they immediately underwent a sharp decline.

The indexes of wholesale prices tell only part of the story. Many other groups of prices underwent fluctuation, but to widely varying degrees. These inequalities of inflation present many problems of internal disturbance in the price system. The following table suggests this dispersion of price groups in the United States. Similar forms of dispersion occurred in all countries.

TABLE II

Price Group	Price Index at End of 1918 (1913 = 100)
Wages	165
Cost of living	180
Rents	110
Wholesale prices	203
General price level (Weighted average of 4 above items)	175
Farm products at the farm	201
Agricultural, wholesale	227
Nonagricultural, wholesale	197

It is evident that wholesale prices increased more sharply than other prices. The increase in the cost of living corresponded rather closely with that in the general average of all groups. Rents were the most sluggish of all prices. Wages lagged behind the cost of living. Farm prices soared to unusual heights. If the group indexes are broken up and individual commodities are compared, one finds extreme dispersion between them.

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[1] Silberling, N. J., *Review of Economic Statistics*, vol. V, 1923, p. 232.

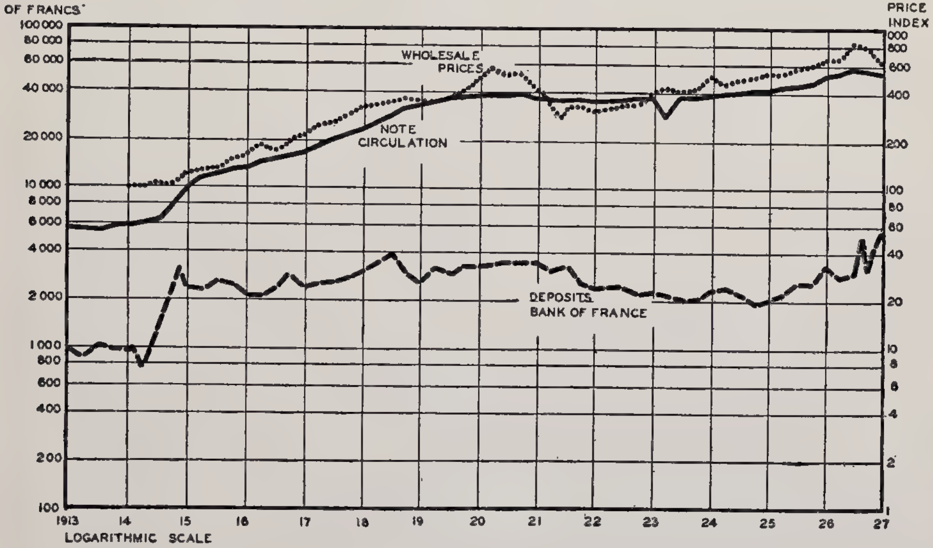
[2] Mitchell, W. C., *Gold, Prices and Wages*, 1860–1880, 1908, p. 23.

These disturbed relationships between prices introduced great instability into the whole price system. They involved inequitable gains to some economic classes and losses to others. They broke up the more or less settled balance of prices which existed when the War began, and created a highly volatile relationship. Hence, a very acute instability of prices was the legacy of the War to the succeeding period of reconstruction.

Post-War Instability of Prices.—(a) *England after 1814.*—The last year of heavy outlay by the English government in carrying on the Napoleonic Wars was 1814. Before the end of that year, prices began to recede from the peak index of 211 (1790=100), and a far-reaching readjustment in trade and finance set in. Within the space of about two years, a demobilization plan more than cut in half the number of men in the army and navy. A retrenchment campaign lowered the total expenditure of the British government from about £113,000,000 in 1814 to about £59,000,000 in 1818. Although the government did not entirely cease to borrow at intervals from the Bank of England, nevertheless its reliance upon this source of revenue was relatively moderate. Consequently, the fiscal policy of the country no longer operated to inflate the currency. Public finance now became allied with the forces of contraction, debt reduction, retrenchment, and deflation.

CHART NO 19

NOTES, PRICES, AND DEPOSITS IN FRANCE



Coinciding with this fiscal reaction, there was a sharp commercial and financial crisis. The labor market was overwhelmed by about 300,000 demobilized men, the commodity markets were demoralized by a collapse of the export market on the Continent, industry was dislocated by the loss of demand for military goods, agriculture was depressed by crop failures and a disastrous slump in farm prices, and banks were caught in a violent reaction from war-time excesses, which witnessed the failure of 240 out of 700 country banks between 1814 and 1816 and the shrinkage of the notes of such banks from £23,200,000 to £9,000,000. Except for a brief period in 1818, these phenomena wrote misery and havoc in the pages of English history for fully seven years. By 1821 the index of wholesale prices had fallen to 117, and thus the peak index of 1814 had been practically cut in half and the purchasing power of the pound sterling had been nearly doubled.

(b) *The United States after 1814.*—The timing of price collapse in the United States after the War of 1812 was much the same as that in England. Peace was declared in December, 1815, and in the first quarter of 1816 the first stages of price decline set in. As in England, the two years immediately following war were marked by acute commercial and financial crisis, and the seven years until 1821 were marked, save for slight interruptions, by protracted depression. As in England, the instability of war prices was an experience which baffled the best economic statesmanship of the day.

(c) *The United States after 1865.*—Northern victory was assured by April, 1865, and the price index fell from the peak, 246, in the first quarter, to 205 in the second quarter of the same year, and to 175 two years later.[1] This deflation was made possible by the fiscal policy of the government. The government stopped the issue of fiat notes in the form of greenbacks, and not only balanced the budget and showed surplus revenue, but also entered upon a policy of debt reduction which by 1880 had practically cut in half the public debt that in 1865 amounted to $2,846,000,000.

In addition to fiscal policy, there were industrial developments tending to pull prices downward. The physical volume of production of the United States doubled within seven years from the end of the war,[2] and the country very quickly grew up to the volume of currency and credit which was inherited from the war. Finally, there were international factors tending to foster deflation. Prices in England in 1865 were only 5.8 per cent higher than in 1861, and in Germany, only 1.4 per cent. The price level of the United States, when expressed in paper, was 111 per cent higher, and when expressed in gold, 20 to 30 per cent higher. If the United States was to return to the family of nations on a specie basis and to retain the pre-war dollar as the monetary unit, it was necessary that the abnormal price level of the United States be written down to correspond more closely with the world level.

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[1] *Review of Economic Statistics*, vol. II, 1920, p. 29.

[2] *Ibid.*, p. 25.

(d) *France and the Assignats.*—The experience of France with the assignats began in 1789 after the French Revolution was under way, continued through wars with England and Austria, and reached its climax in 1797. The country was driven to the issue of fiat paper notes by the necessity of obtaining revenue. The people refused to subscribe to loans, rebelled against onerous taxes, and brought the government face to face with heavy budgetary deficits. During the two years after May 1, 1789, ordinary revenues furnished funds for less than one-third of the government expenditures. The government decided that the valuable lands confiscated from clergy and royalty could be assigned as backing for a new paper note, to be called the *assignat.* They inaugurated the new money in December, 1789. Overissue of paper notes quickly led to a rise of the prices of commodities and a depreciation of paper in terms of gold. Laws and decrees were passed to fix maximum prices for corn and other necessaries, to forbid trading in specie and to impose the death penalty upon anyone who refused to receive payment in assignats. Some of these measures halted for a brief period the tide of depreciation, but could not stem it more than momentarily. When in February, 1796, a total issue of 40,000,000,000 was authorized, the total gold value of the issue was barely 100,000,000 livres, or less than one-fourth of one per cent of the gold value of the pre-Revolution circulation requirements of France. By this time people outside of Paris for the most part refused to use assignats at all, and people within Paris, except speculators and civic employees, were averse to their acceptance.

At this juncture, the government decided to issue fiat notes of a new tenor. These notes, or *mandats,* as they were called. were to be promises to pay land to the bearer on demand, and were to exchange for assignats at the ratio of 1 to 30. For a few months, the government realized some revenue from the issue of the mandats, but it was only a short time until mandats were as worthless as assignats. The paper money simply shrivelled out of existence. The printing presses could not run fast enough to offset the rate of depreciation in the value of money. In February, 1797, assignats and mandats were demonetized and France returned to specie money.

The assignat originated in the desperate need of a government to overcome a deficit of the budget. But the notes were overissued and, in the face of this excess, the pledging of public lands as security for the notes was helpless to preserve their value. Even when a lull in military activity came in 1794, the legacy of revenue deficits was overpowering. Loans and taxes were inadequate and the government could eke out an existence only by following the course of inflation to the bitter extreme. Thus, revolution and war price instability carried over into time of peace, and found the officials of state involved in a debauch of paper inflation which has become a favorite example of monetary fallacies and abuses.

(e) *The American Revolution and Bills of Credit.*—Writing in 1919, R. G. Hawtrey said of the assignat, "It is almost unique as an instance of the currency of a great nation gradually fading away into nothing." [1] As we shall see later, the period since the World War has afforded so many examples of a similar kind that the assignat would no longer be referred to as a unique experience. Indeed, the assignat experience was not altogether unique at the time Hawtrey wrote. The bills of credit issued by the Continental Congress and by the colonies individually during the Revolutionary War depreciated to one-thousandth of their face value. The "fading out" of this currency has been described by one historian as follows: "Like an aged man expiring by the decays of nature, without a sigh or a groan, it gently fell asleep in the hands of its last possessors." [2] From 1775 to 1783, the Continental treasury had derived barely 9 per cent of its total income from taxes. About 57 per cent it had derived from issuance of paper money, and most of the balance from domestic and foreign loans. In addition to the Continental issues, which amounted to $241,552,780, the various colonies issued about $209,000,000 of paper notes. By the end of 1779, the Continental bills were worth only one-fortieth of their face value in silver. In March, 1780, the Congress sought to bring order out of chaos by issuing bills of a new tenor, redeemable in the old at the rate of 40 to 1. The new bills rapidly depreciated to one-fourth their nominal value, and were so ineffectual that few were ever issued. The "new tenor" issues are a reminder of the mandats in France. In January, 1781, the old Continental bills were valued in silver at 100 to 1, and a year later, in sections where they were used at all, at from 500 to 1 to 1000 to 1. Under the Funding Act of 1790, the old notes were acceptable in subscription for government securities at the rate of 100 to 1, but only a very small number were turned in. These bills of credit afford a case where fiduciary currency faded away into nothing even before the war had ended. The instability of value of this fiat money has ever since been popularly recognized in the phrase, "Not worth a Continental." After the war, seven states tried anew to put fiat money into circulation, but met with the usual futile outcome. The new Constitution expressly declared that the states should not "emit bills of credit," but did not make the same restriction upon Congress. During the Civil War, Congress took advantage of this feature of the Constitution in authorizing the issue of the greenbacks.

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[1] *Currency and Credit*, 1923, p. 260.

[2] Ramsay, David, *History of the American Revolution*, 1789, vol. II, ch. XVII.

(f) *After the World War.*—The instability of war-inflated prices has usually been demonstrated by a drastic decline during the conflict or immediately thereafter. This promptness of reaction from inflation has been apparent in the five historical cases just cited. After the World War, many observers expected history to repeat itself, and their expectations appeared to be near to realization when prices in a great many countries receded slightly in the spring of 1919. At that time, wholesale prices in the United States fell from an index of 203 in December, 1918, to one of 193 in February, 1919. But this recession was quickly halted. Budgets were not yet balanced. Many war-time expenses remained to be met, and treasuries resumed the process of borrowing and of expansion of notes and credits. Central bank rates of discount were kept low in order to aid treasury finance. A cyclical boom of business developed and carried prices in most countries upward until early in 1920. Price peaks were reached in the United States and England and several other countries in the spring of that year. In Germany, France, and numerous other countries, prices reacted downward for the time being, although they soon resumed their advance and reached their highest points from two to six years later. These phases of price instability after 1918 are indicated in the charts on pages 281, 283, 327, and 364, and in the accompanying table.

TABLE III

WHOLESALE PRICE INDEXES AT POST-WAR PEAK

Country	Date	Index
1. Sweden	Dec. 1918	372
2. Great Britain	Apr. 1920	313
3. United States	May 1920	247
4. Netherlands	July 1920	296
5. Norway	Sept. 1920	425
6. Denmark	Nov. 1920	403
7. Switzerland	Jan. 1921	238
8. Czechoslovakia	Jan. 1922	1,675
9. Germany	Dec. 1923	126,160,000,000,000
10. Russia	Feb. 1924	17,100,000,000
11. Poland	Feb. 1924	248,429,600
12. Hungary	Dec. 1924	2,346,600
13. Austria	Jan. 1925	2,118,100
14. France	July 1926	837
15. Belgium	July 1926	876
16. Italy	Aug. 1926	740

The Recovery of Price Stability.—War inflation and post-war instability lead to a third phase of monetary difficulties—the recovery of price stability. This phase introduces such problems as whether to deflate prices or to stabilize at existing levels, whether to adopt the old monetary unit or a new one, whether to return to a specie standard and, if so, in what form. As a basis for study of this problem, we may consider three important periods of price reconstruction,—England after the Napoleonic Wars, the United States after the Civil War, various countries after the World War.

(1) *England After the Napoleonic Wars.*—In 1810, the House of Commons appointed the now famous Bullion Committee to make an inquiry into the causes of the high price of gold bullion

and the methods of restabilization of prices. This Committee examined a great number of witnesses and made a lengthy report in June, 1910. Their report for the most part embodied the views of the economist, David Ricardo. Ricardo had written public letters on the subject, had published a pamphlet on *The High Price of Bullion—a Proof of the Depreciation of Bank Notes,* and had appeared as a witness before the Bullion Committee. The practical recommendation of this Committee was that the notes of the Bank of England be contracted sufficiently to wipe out the then existing gold premium of about 15 per cent and to restore the foreign exchanges to mint par.

To appreciate the significance of this proposal, it is necessary to have in mind certain of the general economic views on monetary problems entertained by the Ricardian school. This group held that money was depreciated and the measure of depreciation was twofold,—the deviation of the foreign exchanges on specie-using countries from par, and the deviation of the paper price of gold from the mint price. The unfavorable exchanges and the gold premium were said to be due to the overissue of inconvertible notes by the Bank of England, and also, as an indirect outcome of this excess, to the overissue of notes by the country banks. The rise of commodity prices was declared to be an outgrowth of the depreciation which was reflected in the unfavorable exchanges and the gold premium.

Facing the question of reform of the currency, Ricardo said, "The remedy which I propose for all the evils in our currency, is that the Bank should gradually decrease the amount of their notes in circulation until they shall have rendered the remainder of equal value with the coins which they represent, or, in other words, till the prices of gold and silver bullion shall be brought down to their mint price."[1] The depreciation of money in 1810 was about 15 per cent, and it was thought that a contraction of note issue amounting to not more than £3,000,000 would be sufficient to remedy this depreciation. If the Bank would adopt this plan, the gold premium would disappear, foreign exchanges would cease to be unfavorable, gold would cease to be exported, and specie payments could be resumed. In the future, according to this doctrine, the Bank of England should restrict its note issue with a view to maintenance of the foreign exchange parity and of the standard price of gold bullion. According to this Ricardian doctrine, the overissue of notes was the crux of the whole problem. Remedy this, and all other matters would soon remedy themselves.

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[1] "The High Price of Bullion," section 23, in *Economic Essays*, edited by E. C. K. Gonner.

Parliament and the Bank of England were unconvinced, and the Ricardian-Bullion Committee proposal to contract notes and deflate prices was rejected in 1811. Probably the rejection at this time was wise, as a forced deflation in the midst of the war might easily have caused a financial crisis.

In 1815, an Act was passed to resume specie payments by a gradual process, to be inaugurated during the following year and completed in 1818. In 1816-17, economic conditions appeared favorable to a resumption of specie payments. Government expenditures had been reduced 37 per cent since 1814 and a balanced budget was in sight. An acute financial and commercial crisis had been weathered, during which weak country banks had been forced into failure and their outstanding notes sharply contracted. The balance of trade had turned favorable, exchange rates had actually risen above par, the gold premium had disappeared, commodity prices had fallen more than one-third since the war peak, and gold had flowed into the country so rapidly that by 1817 the gold reserves of the Bank of England were more than three times as great as they had been in 1815.

In spite of these excellent surface appearances, the plan of resumption failed quickly and utterly. In part, this failure was due to international circumstances beyond the control of English officials. The favorable balance of trade proved to be very short-lived. The reasons were various. Heavy invisible imports developed in 1817-18, partly due to loans of about £10,000,000 by England to European countries and partly due to withdrawal of foreign capital to the amount of about £5,000,000. Heavy visible imports developed to fill the deficit of goods caused by the English industrial crisis of 1815-16. To add to these heavy adverse items in the international balance, a sharp financial crisis occurred in certain countries on the Continent in 1818, accompanied by drastic contraction and intense demand for gold. The exchanges again moved outside the gold points, the gold premium reappeared, and gold was exported so rapidly that the Bank of England lost more than half its reserves within two years' time.

Instead of remedying matters by contracting currency, the Bank of England and the government pursued the opposite policy. The government increased its unfunded debt by further borrowing from the Bank. Partly as a result of these fiscal advances, the Bank increased its note issue. Simultaneously there developed a cyclical recovery from the slump of 1816, a new wave of country bank overexpansion, and a sharp rise of commodity prices. Instead of holding inflation in check, the government and the Bank did the very things which inevitably tended to foster it. Gold became less valuable at home than abroad and rapidly flowed out of England.

So the return to gold failed. In the first place, an error was made in assuming that the favorable trade balances and the appreciation of money in 1816-17 were permanent. This error reflected a failure to understand the purely international factors which enter into any effort at stabilization and resumption. In the second place, an error was made by the government in borrowing further sums from the Bank at such a crucial moment. In the third place, an error was made by the Bank in allowing note issue to increase at such a crisis and in announcing that cash payments would begin at the very time when gold coin was sure to flow out of the country. As a result of so much fumbling of policies, the Bank had to rescind its resumption program.

In 1819, a third plan appeared. Parliamentary Committees were appointed and a new Act was passed, providing for a gradual "stepping down" process of resumption. Notes were at first to be redeemed in bullion at a small premium. The Bank was given the option of full resumption of cash payments at par in May, 1821, and was required to make such full resumption not later than May, 1823. The "stepping down" process proved unnecessary, because fundamental economic conditions made possible direct cash resumption. Exchange returned to par in 1819, the gold premium disappeared, the crisis on the Continent ended, inflation in England turned to deflation as the Bank of England contracted its notes and the country banks underwent a new crisis of contraction. Commodity prices fell sharply, and gold imports poured reserves into the central bank. Supported by these fundamental conditions, specie payments were resumed in May, 1821.

What was the aftermath? Commodity prices fell about 11 per cent during the next three years, a favorable trade balance continued until 1823 and moderate industrial prosperity developed. The critical test of gold resumption came after 1823 when an increase of imports reversed the trade balance and caused a drain of gold. The Bank of England, instead of correcting this drain by a policy of contraction, proceeded to aggravate it by increasing note issue and keeping the discount rate too low. Country bank notes nearly doubled within two years, prices sharply advanced more than 10 per cent, and by the middle of 1825 the country was plunged into an acute crisis. The Bank had failed dismally to check a great wave of speculation in its earlier stages, and now it reaped the painful consequences. Confronted with crisis, the Bank tried to ration credit, but such a restriction was too late to be effective. At the crucial moment, the Bank had to take heroic measures to avert outright panic. It then performed the true function of a central bank by advancing the discount rate, discounting liberally, accommodating freely the country banks, and expanding cash by promptly increasing notes. Thus, in spite of its earlier mistakes, the Bank at the critical hour controlled the situation and saved the gold standard.

Viewing the period as a whole, we see that the return to gold and to price stability was a fumbling process, involving many costly errors. The relation of foreign trade balances to the gold reserve seems not to have been grasped at all adequately by the officials. Likewise, the relation of business and financial crises in other countries seemed to escape attention. The conception of control of credit and of gold exports by manipulating the discount rate of the central bank had not taken clear form. The relation of bank note issue to the whole problem was not grasped by the Bank of England directors, with the result that they issued notes when they should have contracted and contracted when they should have issued. As we shall see later, the experiences of this era are of very great significance when we seek to analyze the process of stabilization after the World War.

(2) *The United States After the Civil War.*—In December, 1865, the House of Representatives passed a resolution declaring the "necessity of a contraction of the currency, with a view to as early a resumption of specie payments as the business interests of this country will permit." Early in the following year, an Act

was passed by Congress permitting the Secretary of the Treasury to retire a limited number of greenbacks each month. After $44,000,000 of greenbacks had been retired, this Act was repealed in February, 1868. During the twenty-one months the Act had been in force, prices at wholesale had fallen less than 9 per cent; but this deflation and contraction was associated in the minds of most people with simultaneous maladjustments in trade, agriculture and finance. A very important underlying reason for this sudden unpopularity of the resumption program is found in the international situation. Gold wholesale prices of goods in the United States remained from 10 to 20 per cent above such prices in English and Continental markets, and imports were greatly stimulated. Exchange moved to the gold export point and specie outflow was very heavy, reaching about $80,000,000 in 1868. This loss of gold prevented the banks from accumulating the gold reserves prerequisite to resumption. The gold drain was accentuated by the panic in England in 1867 attending the failure of Overend, Gurney and Company. Thus an external crisis, a heavy adverse balance of trade, a rapid export of specie, and an internal trade maladjustment combined to undermine the first attempt at resumption. The advocates of swift resumption had greatly underestimated the amount of deflation necessary to bring the exchanges back to gold parity. In 1868, the gold premium, which roughly corresponds with the deviation of the exchange from mint parity, was about 140. This deviation could not be remedied over a period of two or three years by the very mild contraction provided by Act of Congress. Moreover, contraction drastic enough to have remedied it would have brought financial crisis and acute industrial distress.

There followed six years of uncertainty and vacillation. In March, 1869, a resolution declared that Congress "solemnly pledges its faith to make provision, at the earliest practicable period, for the redemption of the United States notes in coin." Instead of living up to the spirit of this pledge, the Treasury issued additional greenbacks at intervals, and Congress passed a measure in 1874 to raise the limit of issue to $400,000,000. This proposal was called the "Inflation Bill." Fortunately it was vetoed by President Grant. Later in the same year, the maximum limit was set at $382,000,000. A powerful fiat money bloc developed in

Congress and out, opposed to resumption, contraction, and deflation. In 1873 a violent panic occurred, and liquidation in commodity and security markets took place on a large scale. The remainder of the '70's was marked by a reversal of the trade balance and development of a net excess of exports over imports. The outflow of gold dwindled practically to zero in 1877, and during the next few years gave way to gold imports. Simultaneously, borrowing from Europe largely ceased and payment of interest and principal on the existing investment of foreigners in the United States gave rise to a heavy invisible import. This invisible claim on our resources was largely met by a sharp increase in our exports of merchandise. For the most part, chronic depression prevailed in industry until 1879.

In January, 1874, Congress took definite action by passing the Specie-Resumption Act, providing for gold redemption on and after January 1, 1879. To this end, contraction of note issue from $382,000,000 to $300,000,000 was authorized.[1] Bonds could be issued for this purpose and for the purpose of accumulating a gold reserve in the Treasury to support redemption. When it became apparent in 1877 that Secretary of the Treasury Sherman was likely to be successful in executing a resumption program, commodity prices fell and the gold premium declined. The gold premium vanished entirely in December, 1878, and wholesale commodity prices stood at about 94 (1860=100).

This achievement rested upon a foundation of favorable international circumstances. In 1879 European harvests were much below the average, United States harvests much above. The same situation, to a lesser degree, existed in 1880. The consequent heavy export of agricultural commodities tended to depress our exchange rates to the gold import point and so to favor the accumulation of gold reserves by the Treasury. Within two years, about $175,000,000 of gold was imported. Added to this circumstance was the further fact that no serious external crisis in Europe occurred during the years immediately following resumption. On the contrary, business revival and prosperity in varying degrees predominated abroad as well as at home, and in this cyclical upturn, there was no international strain on the new gold standard in the United States.

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[1] In 1878 the volume of greenbacks had been contracted to $346,681,016. In May of that year, a law was enacted prohibiting further contraction. As a result, the volume of greenbacks now in existence is the same as the volume in 1878.

Why was it possible to cut in half the American price level and bring it into line with world gold prices within a period of fourteen years after the Civil War, although no material contraction of the fiat war paper was carried out? Deflation without contraction was doubtless due in large measure to the very rapid growth of trade and industry. The estimated physical volume of production in the United States, including agriculture, manufacture, and mining, more than doubled during this fourteen-year period. The country thus "grew up" to the currency supply.

Although the new era of gold money started out auspiciously, nevertheless it was soon to meet with acute distress. In 1878 and again in 1890, the silver bloc, determined to offset the effects of abandonment of bimetallism in leading European countries and the United States, succeeded in passing legislation which required the government to purchase large quantities of silver and put it into circulation either as coin or as silver certificates and Treasury notes. This legislation contributed to several ominous developments, the chief of which was a persistent external and internal drain of gold. A fear that silver might displace gold as the standard of value induced the public and the banks to hoard gold to an abnormal extent. Moreover, it induced Europeans who had been lending freely to American borrowers to curtail their loans and even to dispose of a considerable part of their current holdings of American securities. Both of these processes tended to drain gold out of the central redemption reservoir, the United States Treasury, and, in alarming measure, out of the country as well. This drain of gold threatened the $100,000,000 redemption fund maintained by the Treasury, a fund which the public had come to look upon as the irreducible minimum necessary to preserve the gold standard. Under a free and unhampered gold standard, such a loss of gold would tend to be corrected by a contraction of currency and a scaling down of commodity prices. This corrective, however, was frustrated by the persistent injection of new silver currency into circulation. At the very time when currency deflation was imperative if gold exports were to be checked, it was obstinately resisted by the policy of stuffing the channels of circulation with silver certificates and legal tender Treasury notes.

The results of silver inflation began to be uncomfortably apparent by about 1889. During the seven-year period from 1889 to 1896, the net export of gold amounted to about $245,000,000. The situation reached the point of acute danger in 1890 when an external crisis, centering in England and occasioned by the failure of Baring Brothers, London, subjected the New York market to a drain of funds. Prolonged depression in Europe depressed world gold prices, but silver inflation, good crops, and a cyclical boom in the United States held prices above the world level. This discrepancy caused the outflow of gold to continue until a financial panic in the United States in 1893 forced a general suspension of specie payments, a violent contraction of credit, and a sharp deflation of commodity prices. The Treasury stock of gold reserves to maintain redemption and parity of paper currency was depleted, and the government was forced to borrow from the public and from private bankers in order to maintain sufficient specie to adhere to the gold standard.

These turbulent events led to repeal of the silver inflation legislation in 1893, but this repeal was not enough to remedy a process which had gone so far. Depression and price decline in Europe continued, whereas prices in the United States resisted the decline. The measure necessary in the United States to avert further loss of gold was deliberate contraction of currency and credit so that our price level might correspond to the world level. But this measure was not taken, and in 1896 gold export reached $79,000,000. The government struggled to accumulate gold by borrowing, but the gold was released by redemption as fast as it was acquired by borrowing.

Throughout 1896 a bitter political campaign was waged between the free-silver bloc and the gold-standard bloc. The elections marked the triumph of the gold standard. At this juncture trade revived in Europe and prices showed a cyclical upturn. Simultaneously bumper crops in the United States led to enormous exports. These factors rapidly created a favorable international balance, and induced gold imports during the three years, 1897-1899, amounting to over $200,000,000. With political hostility decisively checked and with favorable international balances maintained, the gold standard was saved. In 1900, Congress put to rest all doubt as to our monetary standard by passing the so-called

Gold Standard Act which explicity declared the gold dollar to be the "standard unit of value" and required the Secretary of the Treasury to maintain all forms of currency in the United States "at a parity of value with this standard."

The history of resumption in the United States illustrates dependence of the gold standard upon international circumstances. The balance of international payments, the strain of external crises, and the consequent movement of specie, all were factors too inadequately understood by the political officials of the period from 1865 to 1900. During the latter part of this period, their failure to understand the international connections of prices came near to forcing an abandonment of the gold standard. Like the period following the Napoleonic Wars in England, this period in the United States affords abundant illustration of classic monetary heresies and fallacies, and both experiences were highly instructive when nations after the World War were faced with the problem of restoration of price stability and resumption of a specie standard.

(3) *Various Countries After the World War.*—From the post-war periods of the eighteenth century to those of the nineteenth, the instability of prices shows a very direct and important relation to fiscal policies. Inability to balance the budget carries with it inability to restore price equilibrium. In England and the United States, the ability to check inflation in 1814 was made possible only by the ability first to hold expenditures down to revenues. In the United States after the Civil War, the immediate reaction from inflation was made possible because of confidence that the government could henceforth meet expenses without resort to further borrowing or further issues of greenbacks. In practically all countries after the World War, budgetary difficulties persisted for some time after the Armistice, with the result that price fluctuations were more prolonged and more disastrous than ever before in the history of post-war finance.

No country illustrates better than Germany after 1918 the extreme evils of acute budgetary crises. The reliance upon loans to meet post-War deficits is indicated by the following table:[1]

Even in the most favorable post-War year, 1921-1922, less than half the budget was met by taxes. In the worst year, less than

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[1] Computed from data by John Parke Young, *European Currency and Finance*, 1925, vol. I, p. 393. In general, these estimates agree with those by H. G. Moulton and C. E. McGuire, *Germany's Capacity to Pay*, 1923, p. 159.

TABLE IV

GERMANY—PER CENT OF REVENUE OBTAINED BY BORROWING

Fiscal Year (ending March 31)	Per Cent, Loans to Revenues
1918–1919	80
1919–1920	77
1920–1921	63
1921–1922	55
1922–1923	64
1923–1924 (first 9 months)	88
1923 (month of September only)	99
1923 (month of November only)	99.9

one per cent was met by taxes, and in the worst month of that year, less than one-tenth of one per cent. The staggering growth of public debt under this strain is shown by the following table:[1]

TABLE V

GERMAN NATIONAL DEBT
(Both Funded and Floating Debt)

Date	In Paper Marks	In Gold Marks (Based on Exchange Quotations at Corresponding Dates)
Mar. 31, 1918	105,303,923,100	84,874,962,019
" 1919	156,452,411,300	63,363,226,577
" 1920	184,863,793,500	9,797,781,056
" 1921	264,074,523,100	17,692,993,048
" 1922	352,564,112,800	5,228,461,692
" 1923	6,675,407,329,900	1,335,081,466
Oct. 31, 1923	7,019,640,290,842,000,000	406,000,000
Nov. 15, 1923	191,580,465,280,000,000,000	....

In November of 1923, practically all of the old debt was extinguished by payment in rentenmarks at the rate of one rentenmark to 1,000,000,000,000 paper marks. Thus by payment of a sum equivalent in gold to less than $50,000,000, Germany finally wiped out her public debt of about 200 quintillions of marks. In substance this was outright repudiation of the public debt, but it had the virtue of paving the way for future stabilization and reconstruction.

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[1] YOUNG, JOHN PARKE, *op. cit.*, pp. 540–541.

Was this heavy resort to borrowing due to a failure to make taxes sufficiently high? On this point, the following table contains suggestive data:

TABLE VI

ESTIMATED PERCENTAGE PER CAPITA TAXES OF PER CAPITA INCOME

	1918–19	1921–22	1924–25
United States	10.03[a]	14.3[b]	11.06[c]
United Kingdom	23.93	30.0	24.77
France	12.44	18.0	20.01
Germany	17.42	23.0	29.21

[a] SELIGMAN, E. R. A., *Studies in Public Finance*, 1925, p. 39.

[b] MOULTON, H. G., and MCGUIRE, C. E., *Germany's Capacity to Pay*, 1923, p. 197.

[c] SELIGMAN, *op. cit.*, p. 39. All such estimates must be considered as very rough approximations.

According to these estimates, taxes in Germany during the inflation period were relatively higher than those in France or the United States, but somewhat lower than those in the United Kingdom. During 1921-22, taxes were absorbing nearly one-quarter of the income of the German people. This, however, is not the whole story, since it does not include any allowance for the indirect confiscatory taxation involved in the violent depreciation of money. It appears possible that Germany might have collected about one-fourth more in taxes than she actually did, without imposing any heavier burden upon the country than that imposed by England.

Even had this heavier tax burden been imposed, however, it would have fallen far short of balancing the budget. The increased revenue in 1921-22 would not have meant more than 1,300,000,000 gold marks additional income, whereas the deficit in that fiscal year was over 6,600,000,000 gold marks.[1] The prime cause of the deficit appears to have been the heavy expenditures necessitated in fulfillment of the Versailles Treaty. In 1922-23 about 65 per cent of total net expenditures were on account of

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[1] YOUNG, *op. cit.*, p. 393.

"Treaty Fulfillment."[1] This burden, growing chiefly out of the reparations account, was the crux of the difficulty in balancing the German budget.

The government borrowed in part direct from the buyers of government bonds; but since in considerable measure the people borrowed from the banks in order to pay for the bonds, the process created more bank credits and contributed to inflation. In the post-War years, the government found this method too slow and unproductive and so came to place almost complete reliance upon direct borrowing from the Reichsbank. The government discounted Treasury Bills with the Reichsbank and obtained either deposit credits or bank notes. By far the more important was bank notes. The government put these notes into circulation by making disbursements to meet its expenses, and thus created a swollen volume of media of exchange which followed through all the channels of trade, production and finance.[2] In consequence, the fiscal policy of the government, linked with the printing press and the Reichsbank, precipitated a furious and devastating period of price inflation throughout Germany.

The post-War inflation in France was less extreme but more prolonged than that in Germany. The peak of prices was reached in Germany in December, 1923, with an index of about 126,160,000,000,000 (1913=100), whereas it was not reached in France until July, 1926, with an index of 836, (1913=100).

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[1] Moulton and McGuire, *op. cit.*, pp. 181–182.

[2] The following table shows some of the phases of this expansion.

GERMAN REICHSBANK[a]

Date	Discounted Treasury Bills (millions of paper marks)	Notes in Circulation (millions of paper marks)	Wholesale Prices (1913 = 100)
Jan. 1921	50,594	66,620	1,440
Jan. 1922	126,160	115,375	3,670
Dec. 1922	1,184,464	1,280,094	147,480
Jan. 1923	1,609,081	1,984,496	278,500
June 1923	18,338,000	17,291,000,000	1,938,500
Oct. 1923	6,578,650,939,000	2,496,822,909,000,000	709,480,000,000
Nov. 15, 1923	189,801,468,187,000	92,844,720,743,000,000	72,570,000,000,000

[a] Young, *op. cit.*, pp. 522–528.

In France, as in Germany, fiscal deficits constituted the underlying cause of inflation. The reliance upon borrowing to make up such deficits is indicated by the estimates below:[1]

TABLE VII

PER CENT OF TOTAL REVENUES OF FRANCE OBTAINED BY BORROWING

YEAR	
1919	79
1920	65
1921	55
1922	51
1923	48
1924	36

In the best year, more than one-third of the revenue was borrowed and in the worst year, more than three-fourths. In consequence, the internal public debt of France more than doubled during the six years following the War.[2] In 1924, the estimated deficit was about 16.5 billion francs; in 1925, 11 billion. In 1926 a slight surplus was realized, and in 1927 the budget was definitely balanced.

Although revenue was raised by loans, the tax burden was by no means light. It grew from about one-eighth of the national income in 1919 to one-fifth or more in 1922 and three-tenths thereafter. This ratio of taxation to income was not, until after 1922, as high as that in England, but it was much higher than that in the United States. In order to balance the budget in 1927, the burden of taxation had to be increased. The new burden probably exacted from 30 to 33 per cent of the national income, but only this heroic effort could save the franc from the complete collapse which befell the mark.

Some critics have claimed that the deficits were due to the cost of a large military establishment and to extravagance and waste on the part of the government. On this criticism, the following classification of expenditures for 1924 has bearing:

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[1] Computed from data by H. G. MOULTON and C. A. LEWIS, *The French Debt Problem*, 1925, p. 85.

[2] According to estimates by J. P. YOUNG, *op. cit.* The increase from 1918 to 1924 was as follows:

Year	*Internal Debt* (billions of paper francs)	*External Debt* (billions of gold francs)
Dec. 31, 1918	123,794	29,320
June 30, 1924	277,850	39,927

TABLE VIII

Form of Expenditure	Per Cent of Total Expenditure
Interest on public debt	36.2
Pensions	8.0
Military charges	16.7
Civil expenditures	21.5
Physical reconstruction	17.6
	100.0

The entire military charges for this year were less than half the deficit. If the entire military establishment had been abolished, a deficit of nine billion francs would still have existed. The main sources of budgetary trouble must be looked for elsewhere. They are to be found in the interest on the public debt, pensions, and physical reconstruction. All these charges are direct legacies of the World War. In the aggregate during 1924 they made up 61.8 per cent of all expenditures. During the period after 1918, the debt charges alone amounted to about one-third of all expenditures. As the public debt grew, the burden each year became more formidable. On March 31, 1926, the internal debt amounted to 288 billion paper francs. In addition, the external debt amounted to 250 billion paper francs or about 36 billion gold francs.

Borrowing to cover deficits made the government dependent upon the Bank of France. This central bank not only made advances direct to the government, but also made advances to private banks on security of government paper, which the private banks in turn used as a basis for loans to the government or as a basis for accommodating individuals who made loans to the government. Thus, at the end of 1925, 87 per cent of the assets of the Bank of France were in the form of these government credits. Meantime, notes of the Bank of France increased from 30 billion francs at the end of the War to 50 billion at the end of 1925. This new purchasing power was not accompanied by any corresponding increase of commodities, and price inflation inevitably ensued. The inflation could not be halted until, in 1926-27, the government balanced the budget, reduced the borrowings from the Bank of France, and so made possible a halt in the expansion of paper francs.

In England, the price peak was reached in April, 1920, with a wholesale index of 313 (1913=100).[1] This peak was much lower and arrived much earlier than those in either France or Germany. The ability of England to hold inflation under more rigid control than other countries was a direct outgrowth of her more successful handling of the public budget. The fiscal year ending March 31, 1920, was the last year to show a deficit, as well as the last year to be marked by sharp inflation. Thereafter, the budget was balanced and, each year, was made to show some surplus. This achievement followed out the recommendation of the first Cunliffe Committee in the autumn of 1918:[2]

> It is in our judgment essential that government borrowings should cease at the earliest possible moment after the War. A large part of the credit expansion arises from the fact that the expenditure of the government during the War has exceeded the amounts which they have been able to raise by taxation or by loans from the actual savings of the people. . . . It is essential that as soon as possible the State should not only live within its income but should begin to reduce its indebtedness.

Why was England able to balance her budget whereas Germany and France were not? In part the answer is that England was not subject to such onerous reparations and treaty fulfillment expenditures as Germany, nor to such heavy costs for reconstruction of war-damaged areas as France.[3] On the other hand, England's burden of internal debt was proportionally no less severe than that of the other countries. In part, the answer is that England submitted to heavier taxation than other countries. In order to balance her budget, England submitted to taxation which in 1921-22 amounted to about 30 per cent of the national income, whereas in the same year, the corresponding estimate for Germany was only 23 per cent, for France only 18 per cent, and for the United States only 14.3 per cent.

Paralleling this budgetary policy, England adopted measures for restriction of currency and credit. On December 15, 1919, a

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[1] Statist index, 45 commodities at wholesale.

[2] *First Interim Report of the Committee on Currency and Foreign Exchanges after the War*, Lord Cunliffe, Governor of the Bank of England, Chairman. Appointed in January, 1918, reported August 15, 1919. A final report by this Committee was made on December 3, 1919.

[3] In 1920, 35.9 per cent of France's net expenditures were for reconstruction. During the five years after the War, Germany's expenditures for treaty fulfillment ranged from one-fifth to two-thirds of all expenditures.

Treasury Minute declared that the maximum fiduciary issue of currency notes in 1920 should be £320,600,000, and in any subsequent year should not be in excess of the actual maximum fiduciary circulation (*i.e.,* the currency notes not covered by gold or Bank of England notes) of the preceding twelve months. A continuous decline of such currency notes set in, and by 1925 their volume had fallen about one-fifth. Bank deposits, which are more important than notes in the English banking system, were stimulated by the low interest rates which both the Treasury and the Bank of England maintained as long as new government loans were being offered to the public. After the War, the Bank rate was gradually freed from Treasury domination. In November, 1919, the Bank rate was raised from 5 to 6 per cent, and in April, 1920, from 6 to 7. Rates on British Treasury three-months bills rose from 3½ per cent at the end of the War to 6½ per cent in April, 1920. These rate adjustments lent their influence, although they were by no means the sole cause, toward halting the process of inflation. The process culminated in April, 1920, and led to a commercial and financial crisis and a drastic deflation and liquidation in commodity markets.[1]

In the United States prices stood at 203 when the Armistice was signed, receded to 193 in the spring of 1919, and then rose to an inflationary peak in May, 1920, with an index of 247 (1913 = 100). The post-War inflation grew out of a complex fiscal and commercial situation. The Treasury floated the Victory loan in the spring of 1919, and the 12,000,000 people who bought the bonds oversubscribed the issue. The rate of interest on the issue was held down to 4¾ per cent, although short- and long-term rates in all competitive money markets were relatively at much higher levels. The Federal Reserve Board and Banks kept the discount rate down to a level of from 4 to 4½ per cent on 15-day paper at the various institutions. In August and September of 1919, Federal Reserve officials expressed the desire to raise the discount rate, but the Treasury opposed such a move on the grounds that it would hinder the government in its financial program based upon low interest rates. The Board has explained that, "Discount rates were of necessity fixed with the primary object of assisting the Treasury operations."[1]

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[1] Fuller discussion of the situation in England is given in a separate chapter devoted exclusively to that country.

However, by November, 1919, the Reserve Banks regained some of their freedom to adjust discount policy to commercial requirements, and all of them raised the rate one-quarter of one per cent. By June, 1920, the discount rate had been advanced to 7 per cent, and the country was on the threshold of an acute transition to a lower price level. Looking backward, most students of the period now agree that the rates fixed by Treasury and Federal Reserve up to 1920 were too low. Such a situation stimulated overborrowing for commercial and speculative purposes, and contributed strongly to a cyclical wave of prosperity and extravagance which culminated in 1920. A large amount of government and of bankers' credit was extended to European countries and used by them to purchase goods from the United States. This artificial stimulus to our export markets, accompanied by a boom psychology in the domestic market, developed a typical wave of speculative prosperity which is familiar to students of the business cycle. In part the inflation of the period was merely the manifestation of one phase of the major cyclical movement of business. But to one who looks at the more ultimate antecedents of the inflation, the fiscal policy of low interest rates, additional bond issues and foreign loans is the factor of greatest significance. Thus, in the United States, as in England, France, and Germany, public finance played a commanding rôle in the great post-War movement of prices.

The four countries singled out for illustrative study of fiscal policy are typical of a situation world-wide in scope. The fiscal crises which occurred in England, France, Germany and the United States exhibited the basic characteristics of similar crises in practically all countries which had participated in the War. The setting varies from place to place, but the phenomenon is essentially the same. This broad international scope of the problem is clearly recognized in a significant joint statement prepared by economic experts of five countries[2] for the International Finance Conference held at Brussels in 1920:

[1] *Annual Report*, 1919, p. 68.

[2] G. Bruins, The Netherlands
Gustav Cassel, Sweden
A. C. Pigou, England
Charles Gide, France
M. Pantaleoni, Italy

> 1. It is essential that the inflation of credit and currency should be stopped everywhere at the earliest possible moment.
>
> 2. To this end, government spending must be cut down, the conduct of government enterprise at less than cost and the payment of subsidies on particular commodities and services must as far as possible be abolished and military and naval expenditure stringently restricted.
>
> 3. The equilibrium of State budgets must be restored, loans not being employed to meet ordinary current requirements.
>
> 4. Artificially low bank rates out of conformity with the real scarcity of capital and made possible only by the creation of new currency must be avoided.
>
> 5. Floating debts should, as soon as practicable, be funded.

Subsequently, in 1922, an International Conference at Genoa affirmed similar resolutions, of which the following excerpt is significant at this point:

> 1. The essential requisite for the economic reconstruction of Europe is the achievement by each country of stability in the value of its currency.
>
> 2. Banks, and especially banks of issue, should be free from political pressure, and should be conducted solely on lines of prudent finance. . . .
>
> 3. So long as there is a deficiency in the annual budget of the State which is met by the creation of fiduciary money or bank credits, no currency reform is possible and no approach to the establishment of the gold standard can be made. The most important reform of all must therefore be the balancing of the annual expenditure of the State without the creation of fresh credits unrepresented by new assets. . . .

Both of these documents were important milestones in the economic thinking of the world after the War. Not all countries were able or willing to follow out the principles enunciated, but in general the eyes of statesmanship were pointed in the new direction. The great post-War monetary problem was the instability of prices, and solution of this problem rested at the outset upon understanding of the close interdependence of public finance and monetary inflation. The World War, like the Civil War and the Napoleonic Wars, will always furnish economics with classic examples of the violent instability of prices under conditions of unsound fiscal statesmanship.[1]

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[1] The emphasis placed upon public finance is not intended to give the impression that other processes were not of basic importance. The movement of production and trade and the phases of cyclical fluctuation which were contemporaneous are no less important. The cyclical aspect is discussed at length in a separate chapter. Moreover, the events and relationships which have been described in post-War finance are of great interest from the standpoint of the theory of the value of money. The quantity theorist, as well as the student with other hypotheses, finds a wealth of material to challenge attention. Such theories are discussed in the following chapter.

Chapter XV

THE WORLD WAR AND THEORY OF THE VALUE OF MONEY

Value Theory and War Inflation.—The monetary experiences of the War period have been classified in the foregoing treatment under the headings, War inflation, Post-War Instability of Prices, and Recovery of Price Stability. Although this classification is somewhat arbitrary, nevertheless it is useful for the purpose of studying monetary theory, since it marks out certain distinct phases of the fundamental movements of the period. With respect to each phase, it is possible to identify far-reaching processes of change.

It is important to recognize that the period is profitable to the student of monetary theory largely because it is a dynamic period. Not only is there change, but there is also a very rapid rate of change. The rate as well as the amplitude of fluctuations bring out in sharp relief phenomena which in more normal times are not so apparent. Hence, the economist finds here an opportunity to study in their extreme manifestations phenomena which are not so clear in the drab light of peace times.

If one approaches these severe disturbances armed merely with the formula of the quantity theory, he is likely to handicap his investigation. That theory is primarily a static theory, whereas we are now dealing with highly dynamic conditions. We are faced with sharp transitional processes, not with "passive," long-run tendencies. This is not to deny that the algebraic equation $MV + M'V' = PT$ is a most useful and necessary tool, if it can be treated solely as a statement of a mathematical identity or truism applying to any point of time, and divorced from much of the dogma associated with it as to what is cause and what is effect. The conception of a mathematical relationship between the six factors in the equation is a constant guide to study and a suggestion to the student of what must be approximately true at any moment of time.

However, when one propounds questions such as: Is M the cause of P or P the cause of M, he finds that this manner of stating the problem is largely futile. There is room for skill in formulating the issues in such a manner that they are analyzable. By this test, the old and often futile discussion of causation between M and P goes by the board. Then it is possible to come directly at the elements of a very complex series of events, and to observe the mutual interactions of many related factors. With this general attitude, let us consider the relatively moderate inflation which occurred during the period of actual hostilities.

Each belligerent faced an immediate urgent need for the goods and equipment of combat. This demand for munitions and supplies was insistent. Governments could not wait for the slow and orderly processes of production and distribution. Purchases of existing stocks were made and contracts for future supplies were entered into. As soon as it became evident that the struggle would not be decided within a few weeks, as most countries had at first expected, but would be a prolonged test of strength, this government demand for supplies became continuous. In 1917-1918, the money outlay of the governments of both England and Germany was equal to about 50 per cent of the national income of those countries.

This purely war demand was in large part additional to the customary consumption of the country. Exception must be made for food and clothing, because the personnel would have had these minimum necessities in peace or war. But the military demand, as such, introduced a new and additional demand. The demand for "nonessentials" became somewhat less than normal, under the pressure of thrift, rationing, etc., but not proportionately less. Hence, the demand for war goods in substantial degree constituted a net increase in aggregate demand for goods.

In order to make their demand effective, governments resorted to taxes, loans, and note issues. Taxes and part of the loans were met out of savings by the people. However, a considerable part of the loans was secured by borrowing directly or indirectly from the banks, a process which involved a rapid expansion of bank credit. Moreover, the issue of notes was resorted to as a device for securing purchasing power when other devices proved inadequate. When the governments entered the markets with new money and engaged in competitive bidding for merchandise, the prices of goods were pushed upward.

As soon as the governments made disbursements, the new credit and currency passed into general circulation. Contractors, manufacturers, dealers, laborers, found their money incomes larger in varying degrees. They bid against each other for raw materials, transportation and labor, and the more anxious contenders offered more money than before for these factors. They were emboldened to bid high because the chances of making unusual profits were great.

Soon all classes were drawn into a tide of unusual competitive bidding. Buyers of all kinds became bullish. A seller's market prevailed. Ordinarily such a mass attitude prevails only during the boom phase of a business cycle. It is a psychological phenomenon which is favorable to the further absorption of money and credit. During the War, this phenomenon meant that the temper of the community was *inflatable*. Business was receptive to the fresh issues of notes and credit and complained of a "scarcity of money" if they were not forthcoming.

The governments themselves found no convenient stopping point in their creation of new purchasing power. There was no let-up in the desperate need for munitions and supplies. Indeed, each successive year of warfare consumed more heavily than its predecessor. Any given budget was drawn up to provide expenditures at the then existing price scale. But by the time the revenues were secured, prices had advanced, and the revenues were inadequate. Hence, at the new level of prices, more money revenue was necessary in order to make demand effective. Each new issue of notes and credits allowed competitive buyers to bid higher, and as prices rose, new issues of notes and credits became necessary. Thus, the initial expansion of notes and credits set in motion a price advance, and thereafter "real revenues," that is, revenues in terms of actual purchasing power, tended to lag behind prices. This fiscal lag put the governments in a position where they constantly felt compelled to create more money.

Private traders, finding these repeated installments of new money passing through their hands, fell into line with the situation. Certain commodities, "leaders" they might be called, registered the influence first. Essential war supplies received the first impact of the new money-spending power. Commodities of inelastic supply displayed a serious shortage. Such articles quickly rose to unusual price peaks. But all interrelated industries were soon affected. Corporations found all their costs mounting rapidly, and set up the complaint that at the new level of costs, they had to have more accommodation from the banks. This group trailed in the procession, but clamored incessantly for more money in order to keep up with rising prices. Thus in the case of the goods which have been called leaders, the rise of M often preceded the rise of P, whereas in the case of the goods which may be called "trailers," the rise of P often preceded the rise of M.

Consequently the inflation of private credit proceeded apace with that of public credit. The fiscal policy of the governments was the result of their urgent search for a purely pragmatic method by which to meet a desperate need for war goods. It was applied to communities which were rapidly stimulated to an *inflatable* attitude, a state of eager receptivity toward more money. Private and public credit were closely intertwined at every step of the way.

What restraints were imposed in the way of such advances? For one thing, an effort was made to persuade people to practice thrift, so that they might subscribe more heavily to bonds out of actual savings. Again, direct and indirect taxes were made more severe, although governments were timid about "conscripting" income lest the morale of the people be undermined. Pressure in each of these directions was helpful, but fell far short of effective restraint on the inflationary process.

A more drastic form of restraint was price-fixing and rationing. Undoubtedly, price control served to curb for a time the price advance. For instance, in the United States, the prices of 537 controlled commodities fell about 10 per cent during the year from July 1917 to July 1918. This reaction for a few months checked the rise of the average of all prices. However, the check was soon undermined by more fundamental processes. Notes and deposits were expanding all the time, partly due to the manner in which the government derived loans eventually from bank credits, and partly due to the manner in which private borrowers were encouraged to expand their loans by low rates of interest. Under this influence, 793 uncontrolled prices rose 25 per cent between the middle of 1917 and the fall of 1918. Since all uncontrolled prices were rising, and labor costs were mounting, the producers and contractors who furnished war supplies under a price fixing regime were pinched. In many cases they obtained contracts on a basis of cost plus 10 per cent, and therein found an incentive to make costs heavier. In other cases, they demonstrated to the government that a fixed price must be high enough to cover the costs of the bulk of producers in any given line, else producers would be driven out of business and a shortage of product would ensue. Gradually, therefore, price-fixing itself had to adopt an ascending scale. By the end of 1918, the prices of 537 controlled commodities had been allowed to rise so that they stood where they were at the beginning of the price-fixing program. In the meantime, general prices, controlled and uncontrolled, rose from an index of 189 when price-fixing began to an index of 201 when the War ended.

Although these indexes apply to only one country, the United States, nevertheless they are indicative of the experience of most belligerents. Price-fixing slowed down the progress of inflation and demonstrated a real power of control. However, as long as printing presses continued to swell the flood of notes, governments continued to borrow through creation of bank deposits, and banks continued to lend to producers at low interest rates, the basic process of inflation was irrepressible. With one hand, fiscal policy was digging holes through the dikes; with the other hand, price-fixing was trying in vain to plug up the holes.

Some restraint on inflation could have been imposed by raising interest rates. This plan can be defended with many plausible arguments, but the governments were impressed with the scheme of floating loans at low interest rates. It was thought that the less the interest rate, the less the item of interest cost that would have to be met in subsequent budgets. Moreover, central banks were required to keep their official rates of discount on commercial credits in line with the government program. With low interest rates, there was no adequate check on private borrowing. The private loans and discounts of the banks were rapidly expanded and the new purchasing power was used in competitive bidding for goods. Hence, the interest rate, instead of serving the purpose of a restraint, served as a stimulant to the inflationary process.

Finally, restraint could have been imposed by adhering to specie redemption of currency. However, each belligerent, except the United States, in effect promptly abandoned specie payments as soon as war was declared. Gold was hoarded, centralized, embargoed, exported, impounded, locked up, but not allowed to function as a basis for convertibility of currency. Hence, governments were free to augment the flood of promises to pay specie without regard to the restraining influence of convertibility.

All of these happenings in belligerent countries had their repercussions in neutral countries. The situation is well illustrated in the United States during the period prior to her entry into the War. The export demand for products of the United States was greatly intensified. At first, Europe focussed her demand on our foodstuffs, but by 1916, the demand was also very insistent for munitions. In addition, countries of Asia and the Americas, finding normal European sources of merchandise cut off, placed large orders with the United States. In 1916, exports of finished manufactures doubled in physical volume. During the two years from the middle of 1915 to the middle of 1917, wholesale prices rose about 85 per cent. As W. C. Mitchell has observed, "Unquestionably, it was the impetus from Europe that started American prices on their upward course. . . . The goods that led the rise of prices were the goods in most active demand and the goods in restricted supply." [1]

The business community rapidly underwent a conversion to the mood of speculative prosperity. War orders from Europe called for hurry and waste, and producers found it possible to charge unusual prices. The possibility of enormous profits excited the envy of the *entrepreneur.* Full employment of labor expanded domestic consumption. Rush programs of construction and plant expansion aroused intense activity in the industries manufacturing machinery and building materials. The whole attitude of the country became highly receptive to new funds necessary to carry out these extraordinary plans.

A means of carrying out this attitude was found in the new Federal Reserve Bank mechanism. This law lowered reserve requirements, so that the same amount of gold would support more deposits. Within the two-year period, 1915-1916, about $1,000,000,000 of new gold was imported from Europe.[2] This flow of gold represented the effort of Europe to pay for the commodities which she was purchasing from the United States. Gold formerly in circulation in the United States was gradually centralized in reserves, or "impounded," by the Federal Reserve

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[1] *American Economic Review, Supplement,* vol. X, 1920, pp. 131, 136.

[2] Net excess of United States gold imports over exports, 1915–1916, is estimated at $981,000,000.

Banks. On this foundation, bank deposits and Federal Reserve notes expanded. The new money and credit was rapidly absorbed by eager borrowers and producers and spent in the commodity markets. The rise in prices was made possible by this new purchasing power, after the way had been prepared by the remarkable export prosperity of the country.

The neutral countries of Europe did not escape a similar influence. Most of them were placed in a position where they suspended the gold standard, and all of them underwent inflation of a kind comparable to that of the United States.

We may now turn attention to the sequence of fluctuations of certain factors in the price equation. Velocity of circulation probably increased materially during the War. Statistical data for European countries are lacking, but for the United States they show an increase of velocity of bank deposits of about 57 per cent from October 1914 to October 1916. Thereafter velocity abated somewhat and in 1918 averaged only slightly above an average trend (seven-year moving average).[1]

Probably the velocity of circulation in European countries prior to the Armistice did not increase by more than a very moderate percentage. It was not at that stage a major factor in price fluctuations.

Volume of trade probably declined in most European belligerents. In the United States, the peak of physical volume of production was reached before 1918. Production in 1918 was about 5 per cent less than in 1917.[2] In Europe the loss of man power in production was severe, and blockade and devastation wrought their havoc. A scarcity of goods was felt everywhere. In terms of the equation of exchange, T suffered a decline. This would tend to lessen the actual need for money as a medium of exchange. Since money was expanding at the very time T was contracting, the rise of prices would gradually tend to be more than proportional to the rise of money.

With regard to P and M, there was a clear tendency for the rise of prices to be greatest where the increase of the quantity of money and credit was greatest. If index numbers of P and M for leading countries are compared at the end of the War, on a 1913 base, one discovers that P did not rise materially or over any considerable period unless M also rose.[1] This observation does not mean that the percentage of increase of the two items was exactly the same, but it does mean that an approximate correspondence prevailed. This comparison should not be construed as meaning that one was cause and the other effect. They had mutually cause and effect interrelations, and in addition were exposed to the common independent causes which have been discussed in previous paragraphs.

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[1] See SNYDER, CARL, *Business Cycles and Business Measurements*, 1926, p. 153.

[2] *Ibid.*, p. 239.

Moreover, in order of time, there was a general tendency for P to lag behind M. This lag held true in most countries during most of the War period, although in certain instances it failed to be true during the last few months of that period. After the Armistice, the lag was subject to many modifications, to be discussed later. For England, J. S. Nicholson found a lag which he describes as follows:

> In order of time the abnormal increase of currency preceded the abnormal rise in prices and in wages. The period of incubation lasted about five months, and, at any rate, for the first two years of the War, the rise in prices lagged behind the increase of currency. . . . For the remainder of the War period up to the present time [June, 1917], the correspondence in quarters is not so striking, but the general trends of expansion are the same.[2]

Nicholson regrets that lack of quarterly or monthly data on bank deposits makes it impossible to determine the sequence between deposits and prices.

For Sweden, Gustav Cassel found a "general agreement between the rise in prices and the increase in circulation," and a tendency for the rise in prices to follow from the "too plentiful supply of currency." [3] Cassel shows similar results for Russia.[4] For Austria, J. W. de Bordes found that from July 1914 to the spring of 1916, "An increase of the circulation is followed by a rise of prices," and that from 1916 to the Armistice the blockade resulted in a scarcity of goods and "a price level continuously at a much higher level than the circulation." [5]

For the United States, Irving Fisher found that "A change in price level follows a change in total money after a lag of about two months."[1] Holbrook Working states,

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[1] See below, p. 333 for such data.

[2] *War Finance*, 1917, p. 160. By a similar method, Copland finds a lag of the same kind in Australia. See *Economic Journal*, vol. XXX, 1920, pp. 499 ff.

[3] *Money and Foreign Exchange after 1914*, 1923, pp. 56–62.

[4] *Economic Journal*, vol. XXVI, 1916, pp. 320–323.

[5] *The Austrian Crown*, 1924, p. 145.

> The first sharp increase in deposits came in the latter part of 1915 and shortly afterward the price level, which had been increasing slowly throughout the year, began to rise at a similar rapid rate. For over three years of the inflation period the wholesale price index number followed the upward trend of the corrected bank deposit figure, but at a level of 30 per cent higher.[2]

The 30-per-cent discrepancy is eliminated by substituting for wholesale prices alone a general average of retail, wages, cost of living, and wholesale prices. Using such an index, Carl Snyder finds,

> When the great rise in deposits began towards the end of 1915, prices also began to mount rapidly in nearly the same degree. From the high levels of 1920 to the low levels of 1921 there was a fall in deposits of about 17 per cent, and a decline in the general price level of about the same order.[3]

These observations on the World War period may be compared with studies of two previous periods, the Restriction Period in England and the Civil War period in the United States. With respect to the former, N. J. Silberling finds: "The country banks usually expanded their credit slightly in advance of, and during, periods of rising prices, and contracted abruptly prior to, and during, declining prices."[4] At the time, the Bank of England did not have a monopoly of note issue and country bank notes were therefore of great importance. "The major variations in prices precede those of the Bank [of England] advances almost without exception,"[5] and note issues of the Bank of England show no regular sequence. With respect to the Civil War, Wesley C. Mitchell finds that wholesale prices tended to follow the gold premium and that both were traceable primarily to the monetary policy of the federal government in suspension of specie payments and issue of fiat paper money:

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[1] *American Economic Review*, vol. VII, December, 1917, p. 937.

[2] *Review of Economic Statistics*, Harvard University, Committee on Economic Research, vol. VIII, 1926, pp. 126–127.

[3] *American Economic Review*, vol. XIV, Dec. 1924, pp. 707–712.

[4] *Review of Economic Statistics*, Harvard University, Committee on Economic Research, vol. V, 1923, p. 246.

[5] *Ibid.*, p. 240.

> In all these movements from 1862 to 1865 the lines representing the premium and the median of relative prices correspond so well that one cannot resist the conclusion that these changes are mainly due to a common cause, which can hardly be other than the varying esteem in which the notes of the government that constituted the standard money of the country were held.[1]

The lag of direction of price movement behind the direction of currency movement was in general apparent, but the relative degree of increase in the two series could not be computed because of lack of suitable data.

The lag of P behind M does not imply a cause and effect connection between the two factors. Both factors were interacting and were swayed by outside circumstances such as war demand for goods, fiscal policy of governments, and the receptivity of the community to more money. Apparently M was more sensitive to these outside factors than P, and therefore preceded P in fluctuation. This greater sensitivity and earlier rise of M doubtless made possible the further advance of P, for which war demand for goods and scarcity of supply paved the way. Each successive advance of P led the government and private traders to feel that at the new level of prices more money was necessary in order to carry on business. Thus the price curve was a function of numerous closely related factors. It would be a crude over-simplification of matters to claim that M was *the cause* of P.

Value Theory and Post-Armistice Inability of Prices.—Prices during both the Napoleonic Wars and the Civil War passed their climax before the hostilities were fairly ended, and quickly entered upon sharp deflation. During the first few months after the World War, they seemed to be entering upon a similar downward course; but early in 1919, a reverse movement set in and inflation ran rampant until the second quarter of 1920. During a period of about fourteen months, indexes of wholesale prices (1913=100) advanced in England from 217 to 313, in the United States from 193 to 247, in France from 325 to 588, and in Germany from 270 to 1710. Three questions of interest to monetary theory may be discussed. Why did the price increase take place? Why did a deflation crisis set in in 1920? Why did some countries enter upon a new period of inflation after the deflation crisis?

[1] *A History of the Greenbacks*, 1903, p. 279.

First, why did the price increase take place? The answer involves fiscal, commercial, and financial factors. The fiscal factor was the continuation of government borrowing as a means of meeting post-War budgetary deficits. Most governments continued to call upon the banks for credits or notes or both, and these fresh units of circulation had an inflationary influence similar to that previously described in discussion of the War period itself. Even England and the United States, which restored budgetary equilibrium more quickly than most countries, were floating victory loans or other new forms of public debt during 1919. The commercial factor was the development of a world-wide business boom similar in type to the activity which is familiar to the economists as the prosperity phase of the business cycle. W. L. Thorp reports that 14 out of 17 leading countries shared in this broad cyclical advance.[1] A wave of aggressive consumer buying set in as people reacted away from the stinting and self-denial of the War. Extravagant consumption characterized the behavior of society. Over against this clamor for merchandise was a real shortage of goods of the types demanded. Capital had been destroyed, and productive capacity of European countries probably was from 10 to 20 per cent below the pre-War level. Much of the productive mechanism that did exist was adapted to production of War supplies and could not be immediately adjusted to peace-time production schedules. In the midst of this situation, a strong speculative endeavor appeared. The fear that prices would go up led to forward buying of goods on a tremendous scale. Purchasing agents and dealers accumulated large inventories, contracted far ahead for further stocks, and placed orders in duplicate or triplicate in the hope that at least one of the orders would be filled on time. Speculation in stocks, in urban realty, and in farm lands accompanied the speculation in commodities. The financial factor was the expansion of credit and currency permitted by the banks and stimulated by the continued policy of meeting fiscal defects by fresh loans. The European banks, being off the gold standard, were not checked by any requirements of specie convertibility. Interest rates were slow to rise, and this lag prevented their action as a check upon the demand for credit. Additional notes were issued and satisfied the clamor of those who said that more cash was needed in order to do business at the existing price level. International credit was extended on a lavish scale, principally by the United States, to impoverished countries which wanted to buy commodities. Domestic credit was expanded by the United States under a condition of low interest rates, an abnormal accumulation of gold to furnish reserves, and the expansible structure of the Federal Reserve system. This expansion of credit and currency made possible a bidding up of prices by anxious and over-optimistic buyers. Then, as each successive increment of credit and currency permitted a price advance, this very price advance led traders to greater forward buying of commodities, to greater borrowing from the banks to carry the new stocks of commodities, and to renewed pleas for more money in order to do business at the existing level of prices.

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[1] *Business Annals*, 1926, p. 86.

Is it possible to emerge from this complex situation with any simple formula of precise cause and effect? It is misleading to say that M caused P, since we have first to account for the extraordinary receptivity of the community to increases in M. This leads into fiscal and commercial factors as outlined above. But it is also misleading to say that P caused M, since without successive increases in M, further increases in P would have been impossible. Let us, therefore, set to one side the crude question of causation, and view the complex situation of many interrelated elements. We then discover that M and P constantly interact upon each other and that both are under the influence of outside common factors, such as fiscal deficits, consumer psychology, shortage of goods, and deficient productive capacity.

The second major question is: Why did a deflation crisis set in in 1920? Japan had a deflation crisis beginning about March, 1920. Exhaustion of bank reserves, increase of the rate of discount by the Bank of Japan, consequent contraction of credit, and discovery that an oversupply of silk existed, combined to precipitate a liquidation of silk and other commodities and a decline of wholesale prices from 321 in March, 1920, to 247 three months later. Early in 1920, trouble was also apparent in another part of the world—Central and South America and the West Indies. A great boom in foreign trade with the United States had been financed in large measure by foreign credits of United States bankers. Overspeculation in commodities and use of credits to hold high-priced stocks of goods made the bankers uneasy. Their attempt to apply caution to foreign banking in 1920 contributed to a liquidation of goods and a fall of prices of many articles derived from the Americas. Meantime, in Germany, prices toppled from an index of 1710 in March, 1920, to one of 1370 in July of that year. This decline cannot be attributed to contraction of money, since note circulation, before, during and after, the deflation steadily increased at the rate of two to four billion marks each month.

Rather, it must be attributed primarily to improvement in the foreign exchanges accompanied by acute industrial depression. The average New York quotation of the mark rose from 1.05 cents in February, 1920, to 2.53 cents in July of that year. Of course, in Germany, the paper price of dollars fell correspondingly, and with this fall, import and export prices of commodities were marked down. The exchange improvement is attributable to movements in the balance of trade and to bullish speculation in the mark, rather than to any current changes in the internal volume of paper money.

The price decline, already under way in various countries, did not get definitely under way in England, France and the United States until May and June of 1920. In the accompanying table the high and low wholesale indexes of these countries are compared with those of other countries during 1920 and 1921. Ac-

TABLE I

DEFLATION 1920–1921

WHOLESALE PRICE INDEXES (1913 = 100)

Country	Peak in 1920		Low in 1920		Low in 1921	
	Month	Index	Month	Index	Month	Index
Germany	March	1710	January	1260	May	1310
Great Britain	April	313	December	243	December	157
France	April	588	December	435	June	325
Italy	May	700	January	550	June	509
United States	May	247	December	179	December	140
Sweden	June	366	December	299	December	172
Netherlands	July	296	December	233	November	165
Norway	September	425	January	333	December	269
Denmark [a]	November	403	January	340	November	186

[a] No index numbers available for February–June, 1920, inclusive.

cording to Thorp's *Business Annals,*[1] all except one of the seventeen countries within the scope of his survey suffered "recession" in the latter half of 1920 and "depression" in 1921. Since the reaction was so universal in its sway, we must look to international as well as to internal factors when studying the crisis in any single country. In England, France, and the United States, an immediate occasion for the decline was the expectation of deliberate contraction of commercial credit. Central bank rates of discount were advanced until in both England and the United States a 7-per-cent rate on commercial paper was in force by the middle of 1920, and a 6-per-cent rate in France. Commercial banks applied caution and conservatism in credit policy, with the result that borrowers had to limit expansion and often to liquidate commodities and other resources in order to meet their obligation to the banks. The volume of note issue showed little variation in these three countries, but the volume of deposits contracted either before or soon after the price index declined. In the United States, even before the high discount rate was reached, the gold reserve ratios of Federal Reserve Banks had practically reached the legal minimum, and this fact served to impose a policy of contraction upon the banking community.

This credit contraction was superimposed upon an industrial and commercial situation which was ripe for readjustment. Unbalanced production, excessive stocks of commodities, hesitation in consumer buying, waste and rising costs in industry, labor unrest, dispersion of individual prices,[2] unstable foreign markets—all these characteristic features of a crisis were acutely felt. A deflation crisis was the typical corrective for such an unhealthy economic situation.

The sequence of events in England, France and the United

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[1] P. 86

[2]

PRICE GROUP	PRICE INDEX, MAY, 1920 (1913 = 100)
Wages	212
Cost of living	212
Rents	135
Wholesale prices	247
General price level (Weighted average of 4 items above)	219
Farm products at the farm	235
Agricultural, wholesale	241
Nonagricultural, wholesale	254

States was rising interest rates, forewarning of credit contraction, price decline, bank deposits decline, note circulation decline or approximate stability. Exchange rates moved more or less with prices, and both were dominated by the threatened credit contraction and the threatened industrial depression. Public finance was favorable to a halt of inflation since both England and the United States had balanced their budgets, and at the time there were many who had confidence that France would soon be able to do so. Once the fall of prices was under way, business men sought to liquidate their bank accommodations and found that at the new price level they needed less credit with which to do business. Neither P nor M could be said to have been the cause or effect of the crisis, since each interacted upon the other and both reflected outside influences of industrial, fiscal, and international character.

There remains the third question listed above: Why did some countries enter upon a new period of inflation after the deflation crisis? France and Italy soon resumed a price advance, and Germany, Austria, Hungary, and other countries of eastern Europe plunged into an acute inflation of unprecedented extremes. The most fundamental common cause of this new price upturn was the failure of governments to balance their budgets. The origin of deficits varied from country to country. For instance, in France, it was in large part the heavy expenditure for physical reconstruction in devastated areas, whereas in Germany it was in large part the heavy foreign payments on account of reparations. The processes which operated in some degree in many countries are discernible in extreme form in Germany and Austria. A discussion of monetary theory with special reference to these two countries will have general significance for the larger group.

By 1922, it was apparent that Germany was not likely to balance her budget, that further fiscal deficits must be met by additional note issue, that indemnity payments would force the government to purchase foreign exchange in such large quantities that the exchanges would depreciate to extremes, and that an adverse balance of trade was likely to be prolonged by the low productive capacity of a war-depressed country. As these prospects came to be realized at home and abroad, confidence in the future of the finances of Germany weakened. Up until this time, the world's faith in Germany's future had been unwavering, and people had invested in 30 to 40 billion paper marks in the belief that the mark would appreciate in value. But now this faith was undermined. The world turned bearish on the mark, and speculation on a decline in foreign exchange quickly came to dominate the situation. Foreigners everywhere tried to dump their holdings of marks upon the markets before the decline went any further. The very belief and expectation that the mark would decline added force to the bearish dealings of speculators. The rout of the mark was cumulative, as each successive fall served only the further to weaken confidence in its future value. Simultaneously, internal confidence collapsed. Germans found that to hold marks was to hold a currency whose value was wasting rapidly away. The part of wisdom was to convert marks into foreign stable currencies, and so a flight of capital to points abroad ensued. This flight brought the Germans into the exchange market in a vigorous demand for foreign currencies, with the result that quotations in Germany were driven to new heights. Thus, internal and external speculation, feeding upon the collapse of confidence, accelerated the depreciation of the mark beyond all previous records.

The depreciated exchange rates affected in various ways commodity prices in Germany. Every time the paper-mark price of dollars rose in Germany, importers attempted to offset the increased cost of the means of foreign payments by raising the paper prices of the goods. Consequently the prices of goods entering an international market were directly responsive to the movements of exchange rates. These price advances radiated their influence over the whole field of domestic prices. The rise of import prices meant a greater cost of raw materials, and domestic manufacturers felt compelled to mark up correspondingly the sale price of the finished output. Also, the rise of import prices meant a greater cost of imported foodstuffs, and domestic dealers, in marking up by an equal amount the sale price of food, raised the cost of living for the mass of the people. Gradually it was discovered that wholesale prices of many commodities could advantageously be quoted in some foreign unit, as dollars or Swiss francs. Often the foreign money was solely a standard of value and not the actual medium of exchange. The prices expressed in stable foreign currencies were converted into paper marks at the rate of exchange for the day, and the domestic wholesale price thus was automatically fitted to the daily rise of the exchange rate. As retail dealers discovered this automatic mark-up of wholesale prices, they in turn either quoted retail prices in foreign money or advanced paper retail prices to match the exchange rate. Hence, in manifold ways, internal prices followed, with some lag, the rise and fall of exchange rates.

While the loss of confidence and the growth of speculation, by swaying exchange rates, were pushing commodity prices upward, they were at the same time exerting profound influences upon the whole money economy. To a very considerable extent, people reverted to direct barter in order to eliminate the risk of holding a money of vanishing value. Moreover, to a very considerable extent, people resorted to the substitution of foreign currency for domestic. This action is described by the Second Committee of Experts under the Dawes Commission:

> There is in Germany a large quantity of foreign bank notes (dollars, florins, Scandinavian crowns, Swiss francs, pounds sterling, and more especially in the occupied territory, Belgian and French francs). The exceptional plight of the German mark has influenced Germans in acquiring stable currencies wherever possible and on a large scale. These foreign notes have remained in the country instead of finding their way abroad again through the normal channel of trade, as would have been the case in ordinary circumstances.
>
> Various estimates of the total amount of such notes were made in Germany, particularly towards the end of 1923. The Committee has compared the different estimates with the information which it collected in Germany and other countries. In its opinion the value of the foreign notes existing in Germany at the end of 1923 amounted to about 1.2 billion gold marks.[1]

This foreign money represented more than twice the gold value of the domestic circulation in June, 1923, and more than fifteen times that of October 31, 1923.

But perhaps the most significant change wrought in the domestic money economy was the loss of demand for marks at a much more rapid rate than the quantity of marks increased. Under circumstances of moderate depreciation of paper money, the elasticity of demand for money is approximately unity.[2] That is to say, if the quantity of currency doubles, prices and exchange rates will so adjust themselves that the total purchasing power of the currency over goods will remain approximately constant. Double the currency will command about the same amount of goods as before, and each individual will keep in the form of ready purchasing power in hand or in bank no less and no more than before. But as soon as depreciation becomes extreme and confidence is destroyed, the situation changes sharply. The elasticity of demand becomes much less than unity and the greater the volume of issue the less the total purchasing power of the issue. As a very rough approximation, this discrepancy can be measured by estimating the total value of the currency in terms of gold. For the period in question, the calculation involves multiplying the total note circulation of Germany or Austria, for example, by the current exchange rate in gold dollars. The gold values of German and Austrian circulation collapsed in the manner shown by the following table:[1]

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[1] *Reports of the Expert Committees Appointed by the Reparation Commission* (April 9, 1924), p. 138.

[2] For a theoretical exposition of this point, see CANNAN, E., *Economic Journal*, vol. XXXI, pp. 454 ff. For a mathematical exposition, see LEHFELDT, R. A., *ibid*, vol. XXXII, pp. 557 ff.

TABLE II

GOLD VALUE OF DOMESTIC NOTE CIRCULATION IN DOLLARS

Germany		Austria	
Date	Amount	Date	Amount
1913	$1,500,000,000	1913	$100,000,000
1920 (Dec.)	942,600,000	1920 (Dec.)	[a]
1921 (Dec.)	602,300,000	1921 (Dec.)	67,300,000
1922 (Dec.)	128,000,000	1922 (Aug.)	23,000,000
1923 (Oct. 31)	18,626,000		

[a] Data not available.

The most violent collapse of gold value appeared in Germany at the end of October, 1923, when the total domestic currency had a gold value less than one-eightieth of the pre-War requirement. At that time, the paradox was that in spite of a circulation of quintillions of paper marks, there was a famine of money, and Germany was practically devoid of domestic units of real purchasing power over gold or goods.

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[1] See YOUNG, *op. cit.*, pp. 537–538; League of Nations, *Memorandum on Currency and Central Banks*, 1913–1924, p. 76.

The only recourse left to the people was to spend their paper money incomes as quickly as possible. The process common to all countries under extreme depreciation has been described for Austria as follows:

> When prices are rising from week to week, or it may be from day to day, and when it is known that the money received today will be worth less a few days hence, it becomes essential to part with it as quickly as possible and to buy in place of it goods which will not lose their value. To hold money meant inevitable loss; to put it by was sheer wastefulness, as many a wretch learned to his cost who had not been able to adapt himself quickly enough to the paradoxical situation. The art was to pass on one's money, as a kind of Black Jack, as rapidly as possible, to somebody else, to get rid of it *coûte que coûte,* as an infected thing, and to buy goods before there should be a further rise in prices.
>
> Thrifty housewives invested their money in stocks of sugar, coffee, and other nonperishable goods, or spent it on clothes and furniture; others squandered it recklessly—would not wine be dearer on the morrow!
>
> . . . Everybody tried to be left with as little cash in hand as possible. As soon as the wages had been received all the purchases for the week were made.[1]

The same phenomenon can be measured by comparing the percentage increase in note circulation and commodity prices during extreme depreciation. Between the beginning of 1921 and the autumn of 1923, wholesale prices in Germany rose eleven times as much as note circulation. This development is indicated by the accompanying chart. The 100-line on the chart represents an exactly equal percentage increase in notes and prices. The deviation from this line represents the inequality of note issue and inflation. The deviations in Germany were relatively moderate until 1921, and corresponded with those in France. In Austria, between January 1921 and September 1922, note circulation increased about 66 times, whereas the cost of living increased about 152 times. Thus prices rose about 2½ times as much as note issue.[1]

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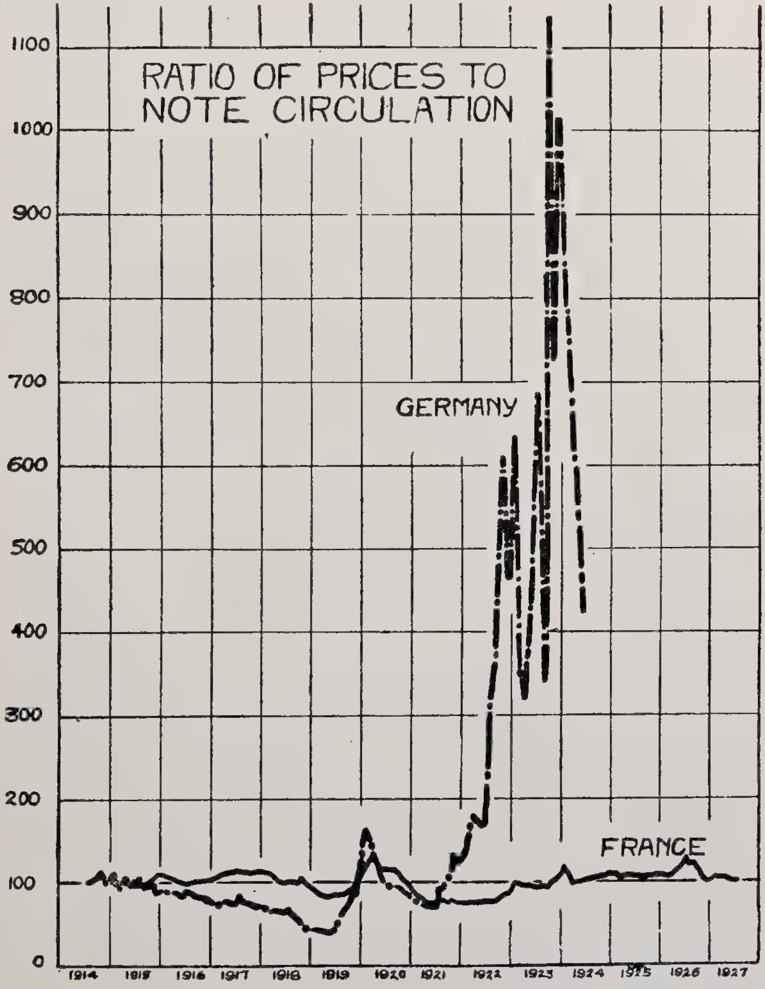
[1] DE BORDES, J. W., *The Austrian Crown,* 1924, p. 163. Describing the same phenomenon, Keynes, in *Monetary Reform,* 1924, p. 51, footnote, says: "In Moscow the unwillingness to hold money except for the shortest possible time reached at one period a fantastic intensity. If a grocer sold a pound of cheese, he ran off with the roubles as fast as his legs could carry him to the Central Market to replenish his stocks by changing them into cheese again, lest they lose their value before he got there; thus justifying the prevision of economists in naming the phenomenon 'velocity of circulation'! In Vienna, during the period of collapse, mushroom exchange banks sprang up at every street corner, where you could change your krone into Zurich francs within a few minutes of receiving them, and so avoid the risk of loss during the time it would take you to reach your usual bank."

CHART NO 20



In terms of the equation of exchange, MV = PT, this process is accounted for as an increase in V, the velocity of circulation. In terms of the formula, $n = p\ (k + rk')$, the process is accounted for as a decrease in k and k′, that is, a decrease in "balances on

[1] A careful analysis of the inflation in Austria, agreeing in the main with the treatment by the present writer, will be found in *The Austrian Crown*, by J. W. de Bordes, 1924.

hand or at the bank, measured in terms of purchasing power."[1] In terms of the theoretical analysis of Marshall or Hawtrey, it is accounted for as a decrease in the "unspent margin" resulting from the making of "consumer's and trader's outlay" immediately upon receipt of money income. In terms of demand and supply analysis, it is accounted for as a rapidly diminishing demand for money, resulting from the loss of confidence in the future value of the monetary unit. Nobody wants the money for more than an instant of time because the holder suffers the loss due to depreciation during the interval. Money is then the worst possible instrument to perform the function of a store of value. Needless to state, these various ways of looking at the process of depreciation are not inconsistent. They are merely different approaches to an understanding of the situation.

A further phase of extreme depreciation is the sequence of prices and quantity of money. The increases in note circulation in Germany prior to 1921 undoubtedly helped to undermine confidence in the mark and so to depress exchange rates and raise prices. The anticipation that more notes would be issued in the future and prices would rise higher helped to create bearish speculation in the mark and so to depreciate it, before the actual note increases had appeared in circulation. Both of these processes forced the paper price of gold dollars in exchange markets to new heights. Paper prices of goods followed the exchanges, and new issues of notes were made in order to enable government and business to make expenditures at the new level of prices. Thus, past note issue and anticipation of future note issue, by undermining confidence, depreciating exchange, and elevating prices, necessitated still further note issue in the future. There was a period in 1921-1923 when M lagged behind P, and increased only a half or a tenth as fast as P; but P itself had been preceded by overissues of M. These complex interrelations frustrate any attempt to define absolute lines of causation between M and P. The situation in its entirety must be taken into account.[2]

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[1] For definition of these symbols, see above, p. 194n.

[2] Allyn A. Young, *Foreign Affairs*, 1924, writes: "That inflation, unbalanced budgets, and disordered exchanges have been among the chief factors delaying Europe's economic recovery is pretty generally known, but it is not so well understood as it should be that the sequence of cause and effect, particularly in the period following the war, has not been inflation, unbalanced budgets, disordered exchanges, but unbalanced budgets, disordered exchanges, inflation." This analysis rests upon the assumption that when P rises out of all proportion to M

Theory of the Value of Money During Recovery of Price Stability.—A rather extended discussion has been given to the theory of the value of money during recovery of price stability in the following chapter devoted to the post-War return to gold, and in a later chapter devoted specifically to England's return to gold.[1] There are, however, certain phases of recovery by countries of extreme inflation which may well be given attention at this point.

Austria stabilized the crown on the foreign exchanges in November, 1922, at 71,060 paper crowns per gold dollar (or $0.0014=100 crowns). During 1923, note issue expanded about 75 per cent whereas wholesale prices remained almost stationary. During the next three years, to the end of 1926, note circulation further increased 30 per cent whereas wholesale prices were at almost exactly the same level at the end of the period as at the beginning.[2] Why did not the great increase in circulation raise prices proportionately? The answer lies in the return of confidence, the balancing of the budget, the stabilization of exchange, the substitution of paper crowns for foreign currency that had been called into circulation during the extreme depreciation, the recovery of trade with the accompanying need for money, and the lessening of the velocity of circulation. Fundamentally, adjustments in T and V made possible an enormous increase in M without any material change in P.

At the beginning of 1924, Germany had a heterogeneous mass of currencies, consisting of no less than thirteen different kinds of domestic currency and of numerous foreign currencies. The total gold value of the domestic currencies was not much more than $500,000,000, an amount equal to about one-third of the pre-War gold value of the currency. The total gold value of the foreign currencies was about $300,000,000. Foreign and domestic currencies combined had a gold value less than half the pre-War requirement. These substitute currencies had been woven into the

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this very fact constitutes a lag of M. However, it must not be overlooked that past excesses of M were a major factor leading up to present disproportionate increases of P. Hence the sequence depends upon how far back one traces the process of inflation and upon whether one views the more rapid rate of increase of P as an index of the lag of M behind P.

[1] See pp.338-352, and 353-380.

[2] A similar situation prevailed in Poland from the end of 1923 to the end of 1925, when note circulation rose 146 per cent whereas prices rose only 40 per cent. See also a discussion of Czecho-Slovakia by B. NOGARO, *Modern Monetary Systems*, 1927, pp. 76 ff., and 113 ff.

business life of the country in countless ways. Private business firms set up accounting systems in terms of gold or other stable values. Contracts were made in terms of stable foreign currencies. Industrialists obtained "stable value" loans expressed in terms of fixed quantities of coal, potash, coke, rye or wood. States, municipalities, industrial corporations, railroads, and all kinds of private business firms, in order to overcome the currency shortage, issued emergency currencies, expressed in gold or paper marks. In October, 1923, the government established a new institution, the Rentenbank, authorized to issue rentenmarks not to exceed 3,200,000,000 gold marks, secured by mortgages on real property, agricultural, commercial, and industrial. Actually, about 2,000,000,000 rentenmarks were issued during the ensuing ten months. Prices came quickly to be expressed everywhere in rentenmarks, and taxes were payable to the government in either old or new currency. The rentenmark served to relieve the monetary strain for the time being, but it was not intended as a permanent remedy. When the report of the Dawes Commission in 1924 led to the creation of a new and permanent central institution, the Reichsbank, the Rentenbank was no longer necessary. It was liquidated in August, 1924, with provision for ultimate retirement of its outstanding circulation.

The new Reichsbank, created August 30, 1924, has monopoly of note issue, save for limited issue by four private banks. The new notes, reichsmarks, are equivalent to one pre-War gold mark, 23.8 cents, and are exchangeable for the old depreciated paper marks at the rate of one trillion to one. The exchange rate is maintained at a fixed point by a gold exchange standard. Under this improvement, emergency currencies and foreign currencies were gradually dispensed with and confidence in the stability of the new currency was firmly established. Between the end of 1923 and the end of 1926, the total metallic and paper circulation expressed in gold increased 128 per cent, whereas wholesale prices remained practically stationary. During the twelve months of 1926, circulation increased about 11 per cent and prices underwent no material change. The explanation of stationary prices in the face of increased circulation is much the same in Germany as in Austria. Return of confidence, exchange stability, a balanced budget, substitution of new currency for old, slowing down of velocity of circulation, trade recovery—all these factors enter into the explanation. When Germany stabilized her exchange in 1924, the gold value of her total circulation was less than two-thirds of the pre-War requirement. As production returned more nearly to normal, there was need for additional currency. Increased circulation meant in part that money was growing up to production and trade. It was necessary to increase circulation in order to prevent a currency shortage and a sharp deflation of prices. Thus, necessary readjustments in V and T required a sharp increase in M if P was to remain fairly stable.

The Proportionality of Fluctuations in Money and Prices.—The unequal percentages of fluctuation of money and prices have been so salient a feature of the War period that some further explanation of the discrepancy is desirable. Part of the discrepancy is due to the nature of the statistical records employed and the index numbers selected; part is due to extraordinary movements in other elements of the price equation.

TABLE III

INFLATION AND DEFLATION AS REFLECTED IN DEPOSITS, CIRCULATION AND PRICES

	United States	Great Britain
Percentage increase in demand deposits. Jan. 1919, peak 1920	16	24 [a]
Percentage increase in circulation. Jan. 1919, peak 1920	10	28
Percentage increase in wholesale prices. Jan. 1919, peak 1920	24	40
Percentage increase in cost of living. Jan. 1919, peak 1920	19	25
Percentage decrease in demand deposits. Peak, 1920, low 1921	15	20 [b]
Percentage decrease in circulation. Peak 1920, low 1921	19	14
Percentage decrease in wholesale prices. Peak 1920, low 1921	43	50
Percentage decrease in cost of living. Peak 1920, low 1921	20	28

[a] Percentage increase from Dec. 1918 to Dec. 1920 of deposits in joint-stock banks of England and Wales.

[b] Private deposits of Bank of England. A decrease of 5 per cent in the deposits of ten London clearing banks was registered during the same period.

With regard to the former phase of the discrepancy, we should clearly recognize that the comparisons have been made in terms of wholesale prices. This group is only one fractional part of the entire price system. There are important movements of retail prices, wage rates, rents, public utility rates, security prices, and real estate prices. Very wide dispersion appears in these various price series, and if we had a perfect general index of all prices, it would be a much more accurate measure of changes in the value of money than any single series, such as wholesale prices. An approximation to such a general index has been attempted by Carl Snyder, and the resulting index shows during the inflation a more moderate increase than wholesale prices and during the deflation period, a more moderate decrease. Thus, at the peak in 1920, the wholesale index in the United States stood at 247, whereas the general index, including wages, rents, cost of living and wholesale prices, stood at 221 (both on 1913 as a base of 100). This general index corresponds more closely with the cost of living than with any other single series. The accompanying table (p. 331), covering data for England and the United States, compares percentages of change with respect to currency and credit on the one hand, and wholesale prices and cost of living on the other hand. The violent rise and fall of wholesale prices stands in contrast with the moderate rise and fall of cost of living. The latter corresponds quite closely in degree of fluctuation with notes and deposits.

A further aspect of the statistical limitation is the inadequate record of actual circulation and of bank demand deposits. The relative importance of the two elements differs widely from country to country. At certain periods, hoarding of the currency takes place, and at other periods, dishoarding. Some part of the currency is sold abroad in order to secure the means of foreign payments or to satisfy the demands of speculators. Emergency currencies spring into existence. Foreign currencies are imported and substituted for domestic. Barter develops on an unusual scale. Bank deposits rise and fall as a reflection of depositors' hopes or fears for the future value of the monetary unit. In the midst of these complex developments, the statistician finds that his indexes are at best loose approximations. Nevertheless the estimates are worth making, and, in fact, when we examine the results from one country to another, we find good reason for having confidence in the substantial accuracy of the figures. The following table brings together numerous indexes of money, credit, and prices and makes possible a comparison of percentages of change at significant periods. The data may well be examined painstakingly by the reader. A summary of interpretation is given in the next section of the discussion.

TABLE IV

INDEXES OF MONEY AND PRICE FLUCTUATIONS[a]

		Dec. 1919 (1913 = 100)	Mar. 1920 (Dec. 1918 = 100)	June 1922 (Dec. 1920 = 100)	Maximum Index	Date of Maximum	Base Period
United States	Prices (general)[b]	201	120	80			
	Prices (wholesale)	223	123	84			
	Notes	178	112	77			
	Deposits[c]	218	115	95			
Great Britain	Prices (wholesale)	276	137	61			
	Notes	250[d]	112	83			
	Deposits[e]	419	67	65			
	" [f]	243	124[g]	93[h]			
France	Prices (wholesale)[i]	423	157	75			
	Notes	378[i]	123	96			
Italy	Prices (wholesale)	457	142	82			
	Notes	649	131	91			
Germany	Prices (wholesale)	803	698	488	587,000,000	Sept. 1923[l]	Dec. 1920
	Notes[j]	634	180	221	35,204,000	Sept. 1923	Dec. 1920
Sweden	Prices (wholesale)	317	95	57			
	Notes	312	91	77			
Austria	Prices (wholesale)	[k]	[k]	[k]	1,772	Dec. 1924	Dec. 1921
	Notes	[k]	[k]	[k]	3,690	Dec. 1924	Dec. 1921
Hungary	Prices (wholesale)	[k]	[k]	[k]	297	Dec. 1924	Dec. 1923
	Notes	[k]	[k]	[k]	485	Dec. 1924	Dec. 1923
Poland	Prices (wholesale)	[k]	[k]	[k]	407,000	Mar. 1924	Sept. 1921
	Notes	[k]	[k]	[k]	390,000	Mar. 1924	Sept. 1921

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[a] League of Nations, *Memorandum on Currency and Finance*, vol. I, and *Documents of Brussels International Financial Conference* (1920), vol. IV, used as sources for most of the above data.

[b] SNYDER, CARL, *Business Cycles and Business Measurements*, 1927, p. 286.

[c] Demand deposits of all National banks.

[d] July, 7, 1914 to March 31, 1920. Allowance made for change in metallic circulation.

[e] "Other Deposits" of Bank of England.

With regard to that part of the discrepancy between the degree of change in M and P which is attributable to other elements of the price equation, we may concern ourselves chiefly with V, V′ and T. War for a time creates a powerful stimulus to trade, which is reflected in the demand for more cash and loans with which to do business. Such accommodation enables traders to bid the prices of goods up to higher levels. Gradually, war depletes man power and destroys capital, with the result that productive capacity in most countries is lessened. For instance, in 1924, the physical quantity of exports and imports of Europe, excluding Russia, was about 11 per cent below the 1913 level. For eastern and central Europe, including Russia, it was 38 per cent below the 1913 level. In 1923, the physical volume of production of Europe, excluding Russia, was about 12 per cent below the 1913 level. Not until 1925 did production regain the pre-War volume.[1]

Statistics for velocity of circulation have been compiled for the United States, but are quite inadequate for other countries. In the United States, the work of Snyder and Burgess in this field has led to the discovery that when the fluctuations of trade and of velocity of bank deposits are compared, "a very remarkable congruence is found to exist, both with regard to the time movement, and the amplitude of the fluctuations."[2] This congruence held during the War period as well as during the price turbulence of 1919-1921. In light of this relationship we must infer that, at least for the United States, velocity of circulation was not excessive during the War period. In his study of *The Austrian Crown,* de Bordes found that velocity of circulation increased greatly during the extreme inflation of 1921-1922, and was a

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[f] Deposits of joint-stock banks of England and Wales.

[g] Index as of Dec. 1920.

[h] Index as of Dec. 1922.

[i] March 12, 1913 to March 12, 1919. Allowance made for change in metallic circulation.

[j] Allowance for change in metallic circulation, emergency currency, and sale of marks abroad.

[k] Satisfactory comparable data not available.

[l] Date of absolute maximum came about December, 1923. Data for September, 1923 are used here because that is about the latest date at which the indexes appear to be comparable.

[1] These estimates are taken from League of Nations, *Memorandum on Production and Trade*, 1926, pp. 17, 35.

[2] Snyder, Carl, *Business Cycles and Business Measurements*, 1926, ch. VII, and pp. 293–299.

primary factor in making possible a rise of prices about four times as great as could ordinarily have taken place on the existing volume of notes in circulation.[1] Keynes declares that during the first impact of war, "The public is so much accustomed to thinking of money as the ultimate standard, that, when prices begin to rise, believing that the rise must be temporary, they tend to hoard their money and to postpone purchases," with the result that velocity of circulation slows down. However, when money is rapidly depreciating, the public, in their anxiety to get rid of a vanishing asset, spend their money the instant they receive it, and so increase sharply the velocity of circulation. Keynes estimates that the price decline in England from 1920 to 1922 was due chiefly to a sharp decline in velocity of circulation (or what amounts to the same thing in his formula, an increase in k and k').[2] Likewise, Hawtrey attributes the price decline of this period to "the stagnation of balances or diminished rapidity of circulation characteristic of a period of depression or falling prices."[3] This analysis for England differs sharply from Snyder's analysis for the United States, for according to Snyder's data the velocity of circulation varies in direct proportion to the changing needs of trade, and so does not alter the price level one way or the other.

In England, it is claimed that velocity fell far out of proportion to the changing needs of trade, and so was a major factor in pulling prices downward. Both Pigou and Robertson hold that Snyder's analysis, although it may be true for the United States, is not true for England.[4] From a survey of the data available, the writer infers that probably there is a real difference in the behavior of velocity of circulation in the two countries. The direction of change in velocity corresponds in both the United States and England with the ebb and flow of business activity, but the degree of change may correspond with the degree of business activity in one country and not in the other.

Such differences in the behavior of velocity of circulation suggest the impossibility of applying a uniform formula to all countries. Fundamental dissimilarities in banking structure or in monetary usage may mean that a rule which is true for one country is not true for another. In order to be on safe ground, one must discover the institutional framework of a given country before drawing conclusions as to how velocity of circulation will behave.

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[1] DE BORDES, *op. cit.*, pp. 161–169.

[2] KEYNES, J. M., *Monetary Reform*, 1923, pp. 50–55, 92.

[3] HAWTREY, R. G., *Currency and Credit*, 1923, pp. 48, 49, 377.

[4] PIGOU, A. C., *Industrial Fluctuations*, 1926, ch. XV; ROBERTSON, D. H., *Banking Policy and the Price Level*, 1926, p. 90, footnote.

Summary of Sequence and Proportionality of Changes in Money and Prices.—From 1915 to 1918, the increase of currency and credit showed a tendency in most countries to precede the rise of wholesale prices, and to correspond rather closely in percentage of increase. From early 1918 to the middle of 1920, the major advances of currency and credit came at about the same dates as the advances of wholesale prices, with no pronounced lag either way. However, the percentage of change of currency and credit tended to be considerably less than that of wholesale prices.

From 1920 to 1921, wholesale prices turned downward some months before currency and credit contracted, and the percentage of price decline was much greater than that of circulation decline. In some countries where inflation was most extreme, the deflation of prices was short lived, but while it lasted was accompanied by a steady increase in circulation. After 1921, countries of extreme depreciation showed a distinct tendency for exchange rates to precede wholesale prices and for wholesale prices to precede the major increases of circulation. Moreover, the percentage of price increase was much greater than that of circulation increase. After 1922 and 1923, when these same countries returned to gold, prices remained practically stationary at the new level although circulation was being expanded rapidly.

Surely here is no stereotyped sequence or proportionality between money and prices. Moreover, one handicaps investigation if one formulates the issue in the form: Is M the cause of P or P the cause of M? Instead, the student of this series of complex monetary situations must deal not only with the reciprocal relations between M and P but also with the many outside fiscal, financial, and psychological conditions with which both M and P have reciprocal relations. Taking this view, we have found a series of type situations, with distinctive sequences and degrees of change. This institutional approach to the monetary theory of war and prices helps to set up an explanation which is close to dynamic realities and yet at the same time in accord with the mathematical truism, MV = PT.

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Chapter XVI

THE RETURN TO GOLD AFTER THE WORLD WAR

Introduction.—During the years immediately following the War, it was by no means clear that the world would return to the gold standard. There were many observers who advocated a permanent paper money of account, a "managed currency," so controlled as to maintain a stable level of prices. For instance, J. M. Keynes declared:

> Since I regard the stability of prices, credit and employment as of paramount importance, and since I feel no confidence that an old-fashioned gold standard will even give us the modicum of stability that it used to give, I reject the policy of restoring the gold standard on pre-War lines. . . . In truth, the gold standard is already a barbarous relic. All of us, from the governor of the Bank of England downwards, are now primarily interested in preserving the stability of business, prices, and employment, and are not likely, when the choice is forced on us, deliberately to sacrifice these to the outworn dogma, which had its value once, of £3 : 17 : 10½ per ounce. Advocates of the ancient standard do not observe how remote it now is from the spirit and the requirements of the age. A sound constructive scheme must provide—
>
> I. A method for regulating the supply of currency and credit with a view to maintaining so far as possible, the stability of the internal price level; and
>
> II. A method for regulating the supply of foreign exchange so as to avoid purely temporary fluctuations, caused by seasonal or other influences and not due to a lasting disturbance in the relation between the internal and the external price level. . . .
>
> When stability of the internal price level and stability of the external exchanges are incompatible, the former is generally preferable; and on occasion when the dilemma is acute, the preservation of the former at the expense of the latter is, fortunately perhaps, the line of least resistance.[1]

Without discussing the reasons, we may note that predominant opinion rejected the Keynes formula and in 1925 decisively recommitted England to the gold standard in most of its pre-War essentials.

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[1] *Monetary Reform*, 1923, pp. 178, 187, 190, 192.

The position of the United States during the period was peculiarly strategic. After the Civil War, the United States stood almost alone among the advanced industrial countries of the world in being off the gold standard; after the World War, she stood almost alone in being on the gold standard. In spite of her unique position after the World War, the United States, nevertheless, faced a real problem of price stabilization. It became a problem whose solution made almost inevitable a far-reaching liquidation in all markets. The price inflation which culminated in 1920 was corrected by a drastic financial crisis and industrial depression. There emerged a gold wholesale price level of about 145 to 150 (1913 = 100) and from 1922 to 1928 prices fluctuated within close proximity to this horizontal line.

Other countries which faced the task of returning to a gold standard had to adjust their internal price levels to the line set in the United States. Consequently, the world problem was how to deflate internal wholesale prices to an index of about 145 to 150.

The present chapter will deal with some of the major monetary problems which confronted the world during this critical reconstruction period.

The Problem of Balancing the Budget.—England illustrates a group of countries which balanced their budgets some years in advance of their return to gold; Germany and Austria, on the other hand, illustrate a group which did not balance their budgets until the return to gold had been definitely decided upon. This difference in budgetary equilibrium largely arises from the fact that the degree of inflation was much greater in the second group of countries than in the first. In the second group, prices, and therefore expenditures, rose faster than government revenue. The close interdependence of budgetary equilibrium and currency inflation is lucidly stated by the First Committee of Experts under the Dawes Commission:

> The currency of a country cannot remain stable unless its budget is normally balanced, for if expenditure continually exceeds receipts there will in time be no alternative to the printing of new notes to meet the excess; and the inflation will inevitably involve depreciation. On the other hand, the task of balancing a budget, unless the currency is relatively stable, is an impossible one, for a falling cur-

rency makes calculations both of receipts and expenses unreliable, and in particular causes a continual loss to the taxing authority through the necessary interval of time between assessment and collection. While therefore in the nature of things it is necessary that the two problems should in the first instance be studied separately, their interdependence must be consistently borne in mind.

On the side of expenditure, the utmost economy must be enforced, government subsidies to private enterprise must be minimized, unnecessary government employees discharged, the military establishment reduced, expensive public construction postponed, official waste and extravagance in all forms eliminated. Short-term or floating debt, both foreign and domestic, must be funded at rates of interest appropriate to peace times, and maturing obligations provided for by the orderly accumulation of sinking funds. Deflation of prices must not be allowed to go to such an extreme that the war debt becomes unduly burdensome. Bondholders subscribed to loans when the purchasing power of money was quite low, and taxpayers should not be required to pay off the bonds in money of high purchasing power. Exception may be made in cases, like Germany, where the internal debt was paid off in worthless currency, or in other words, in effect, repudiated. In such cases, the subsequent deflation does not affect the internal debt burden because that debt has disappeared.

In England and numerous other countries where inflation was relatively mild, the government was able to control expenditures without outside supervision. However, self-help was inadequate in other countries where inflation was extreme. Austria and Hungary, for instance, voluntarily submitted to rigid control of expenditures by an outside administrator appointed by the League of Nations. Germany submitted to limited fiscal supervision by an Agent General of Reparations representing the group of nations entitled to reparation payments. A number of countries have called in outside advisors in order to set their fiscal houses in order. Up to the end of 1926, Professor E. W. Kemmerer had served as advisor to ten different countries. In some instances, control of expenditures by international bankers has played an important part.

These administrative agencies have had to face the problem of increasing revenue as well as that of curtailing expenditure. In some countries, it has been necessary for a time to take about

30 per cent of the national income for purposes of taxation. Of course, reliance upon note issue to obtain revenue has to be definitely abandoned. Likewise, reliance upon further government borrowing as a permanent source of revenue must be terminated. However, in most countries, there is a transition period during which some further emergency borrowing is necessary. At such a critical period, internal borrowing has narrowly limited possibilities; hence, foreign loans must be resorted to. Thus, when returning to gold, England established abroad a credit of $300,000,000, Germany borrowed about $200,000,000, and Austria, Hungary and other countries borrowed accordingly. Not all of the proceeds of such loans was used to meet budgetary deficits, but in most cases the proceeds were available for such purposes in case of need.

By adoption of these policies of economy, taxation and emergency foreign borrowing, one country after another has been able to achieve the budgetary stabilization necessary for a return to gold. Fiscal policy has thus been an integral part of every program of price and currency stabilization.

The Problem of Relating External and Internal Prices.—Let us suppose that after the War, in country X, on a paper standard, exchange rates had returned to mint par, but the index of internal prices was 10 per cent higher than the level of prices in the United States. If country X resumed a gold standard at the old mint par, it had to look forward to a deflation of internal prices to the level of the United States. In other words, a country returning to gold at pre-War parity had to bring internal prices down to the level prevalent in gold-using countries. If it failed to do so, imports would be excessive, foreign exchange would be unfavorable, gold would be drained out, and the gold standard would be endangered.

Let us suppose that after the War, in country Y, on a paper standard, the exchange rates were exactly double the old mint par,[1] but the index of internal prices was 10 per cent higher than exchange rates. If country Y resumed a gold standard on a new devalued monetary unit equal to one-half the pre-War parity, internal prices would have to be deflated about 10 per cent in order to be in equilibrium with world gold prices. Let us vary the case by assuming that the index of internal prices was about 10 per cent *lower* than the rate of exchange at which stabilization took place. It would then be necessary to *inflate* prices after the return to gold in order to establish equilibrium between the external and internal levels.

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[1] That is, as quoted in the paper-money country. In the United States, exchange rates on country Y would be exactly one-half the pre-War mint par.

In both the foregoing cases, the exchange rate is stabilized at a fixed ratio to gold values in other countries, but the world price level is still subject to instability. If world gold prices later fall, due to a shortage of gold or to financial crises, then the internal prices of X and Y and all other gold-using countries will undergo a decline. It is conceivable that country Z might decide to stabilize internal prices, no matter what might happen to world prices. That is to say, country Z might establish a "managed currency," such that the value of money in terms of goods would be constant, but its value in terms of gold would fluctuate. The internal index of prices would be constant, but the foreign exchange rates would be variable. This plan is opposite to the traditional gold standard, which stabilizes exchange rates but leaves commodity prices variable. It claims the advantage of protecting the domestic price level from disturbance due to world changes in gold supply.[1]

No matter which of these processes is followed, the rise and fall of these related elements during the transition period necessarily introduce some disturbance to industry. The shock may be minimized by stabilizing at existing price levels and exchange rates, but even under the most favorable circumstances, some degree of readjustment is necessary. This is the penalty which a country pays for having severed connections with the world standard of money.

The Problem of Deflation or Devaluation: The Level at which Prices Shall Be Stabilized.—England returned to a monetary unit of the same gold content as the pre-War pound sterling. Numerous other countries where inflation had been moderate also resumed at the pre-War parity. Such a procedure involved a deflation of prices to a level comparable with the gold prices of the United States. Thus if the United States had an index of 150 (1913=100) and country X had an index of 170, it was necessary to deflate prices in country X to the lower level.[1] If prices were not thus deflated, the high prices in X would attract imports of goods and thus create an unfavorable trade balance, cause a rapid outflow of gold, deplete bank reserves, and undermine the newly established gold standard.

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[1] This plan has not commended itself to the various countries in process of stabilization since the World War. Its merits are set forth by J. M. Keynes in *Monetary Reform*, 1923, ch. IV.

The process of deflation usually entailed rather serious economic readjustments. Falling prices precipitated industrial depression, caused further inequities in distribution of wealth and income, and inflicted unemployment and wage reductions upon labor. All the countries which returned to gold on the pre-War parity and went through the deflationary process, experienced such a period of industrial distress and readjustment. They were willing to go through the distress in order that they might preserve the "financial prestige" of an unaltered gold unit of money.

But such a policy was impractical for countries whose price levels had risen to extreme heights. Germany adopted a new gold unit, the reichsmark, equal to a pre-War gold mark in gold content but exchangeable for old paper marks at the rate of one to one trillion. Both Germany and England adopted the pre-War gold unit but there was this sharp difference: England adopted a ratio of 1 to 1 between the gold unit and outstanding paper units; Germany a ratio of 1 to 1,000,000,000,000.

Austria, whose pre-War unit was the kronen, introduced a new unit, the gold schilling, equal to $0.1407 gold, and exchangeable for depreciated paper kronen at the rate of one to ten thousand. Many other countries adopted similar plans of "devaluation." The quantity of the new currency was such that prices of commodities could be expressed in the new monetary units at a level comparable with world gold prices. The shift from one money unit to another could in this manner be effected in countries having very high paper price indexes. If prices in Austria had been deflated from an index of 71,000,000 to an index of 150, the shock to the industrial and social system would have been disastrous.

But when a new unit of money was exchanged for the old paper notes at a fixed ratio, and the value of the new unit was kept at parity with gold units of other countries, there occurred a translation of prices into new terms, but no violent deflation. So, when Germany shifted from a price index of about 126 trillion, expressed in paper marks, to one of about 130 (1913=100), expressed in gold reichsmarks, the country, although it experienced a certain amount of strain and readjustment, did not suffer the distress of a violent price deflation.

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[1] It often happened that prices in the United States and other gold standard countries rose somewhat and thus alleviated the deflation necessary in country X.

The advocates of "deflation" usually support their position by stressing the importance of financial prestige. The reputation of financial centers for stability and reliability rests, so it is claimed, upon demonstrating to the world that the pound is always the same pound, a franc the same franc, etc. To quote Hawtrey:

> If our currency [in England] is again restored, as in 1819, to its ancient gold value, this settlement will command more confidence than any other. If its gold value were changed once, it might be changed again. A return despite difficulties to the former parity is a pledge of stability.[1]

This argument has appealed strongly to those in authority, and wherever possible, the countries have preferred to deflate and retain the traditional unit of value. The advocates of "devaluation" stress the importance of avoiding disturbance to trade and production. They argue that the country having depreciated currency should ascertain the existing value of the paper unit as measured by the exchange quotations of its currency in gold-standard countries. A new gold unit, representing as nearly as possible this gold value of the old paper unit, squarely accepts the *status quo*. True, the process of inflation, which has preceded the *status quo*, may have worked grave hardship on debtor classes; but a reversal of the process now will work equal hardship on creditor classes. According to this view, things should be taken as they are, and stabilized in their present form.

The greatest difficulty in deciding between the two lines of argument has appeared in countries where inflation has been of medium proportions. For instance, France and Italy suffered inflation much greater than that of England, but much less than that of Germany. Such governments have clung to the ideal of deflation to the old parity; but the degree of deflation necessary has been too bitter an experience to inflict upon the people. Most economists seem to hold the opinion that in such cases, devaluation is preferred to deflation.[1]

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[1] *Currency and Credit*, 1923, p. 389.

The Balance of International Payments.—It is imperative that, once stabilization has been decided upon, exchange rates shall not be allowed to fluctuate outside the gold points. The chief danger usually is that an unfavorable balance of payments will develop and that gold will be drained out of the country. In order to avoid such an unfavorable balance, it is necessary that both visible and invisible exports be encouraged and visible and invisible imports be restricted.

The ability of a country to carry out this plan depends in some measure upon international circumstances over which the individual country has little or no control. If at the time of stabilization the trade balance is the result of purely temporary international conditions, such as an unusual crop situation, it is inevitable that a return to more normal international conditions will derange the trade balance. Moreover, if at the time of stabilization important foreign countries are just entering the first stages of a financial and industrial crisis, the drain of funds into those countries will deplete reserves of other countries. Hence, it is important that a return to the gold standard should be made at a time when the exchange rate represents a trade balance which is fundamentally permanent in character and which is not likely to be disturbed immediately by financial crises abroad.

With regard to the maintenance of a proper trade balance, we may observe certain basic problems which have confronted various countries. Many countries have attempted to restrict imports by building up tariff walls, and to encourage exports by granting subsidies. In general, such trade discriminations, although they may for the moment appear to protect a country's interests, nevertheless in the long run prove to be artificial and dangerous. More important than such schemes is an attempt to restore the fundamental productive capacity of the nation. This end may be realized by the reconstruction of capital destroyed during the war, the increase of savings, the elimination of labor unrest, and the elimination of the hazards and uncertainties which exist as long as prices and exchanges are fluctuating rapidly. The mere fact of stabilization itself is a profound encouragement to production because it introduces certainty and safety in the calculations of business men.

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[1] Italy adopted the pathway of devaluation in December, 1927. The new lira has a gold parity of 5.26315 cents (the pre-war parity was 19.3 cents) and is exchangeable for outstanding paper lira at the rate of 1 to 3.67. Wholesale prices had been deflated from an index of 633 in August, 1926 to one of 466 at the end of 1927. Thus, both deflation and devaluation were involved in the course adopted by Italy. France's return to gold in 1928 followed a similar pattern.

At the same time, it is important to develop foreign markets. The purchasing power of the foreigner is a source of demand for a country's exports. International peace, coöperation and solidarity are necessary foundations for such improvement.

In addition to these fundamental controls of production and markets, there is a control which automatically exists by virtue of international price relations. Countries returning to gold must keep internal prices relatively low. By so doing, they make their markets a good place for the foreigner to buy, and therefore encourage exports. Conversely, they make their markets a bad place for the foreigner to sell and so discourage imports. In order that the domestic price level may be held down, it is necessary that note issue be restricted and that the rate of discount at the central bank be sustained at a relatively high point. In other words, control of the internal price level is an essential part of the mechanism for preventing an unfavorable balance of payments and a consequent outflow of gold.

The invisible items in the balance of payments are also important, and chief among them is the flow of capital between countries. During the period preceding the return to gold, most countries suffer what is called "the flight of capital." This means that people at home have lost confidence in the future value of domestic money and have therefore endeavored to safeguard their funds by lending or investing them abroad. However, as soon as the return to gold has definitely been announced, there occurs a recovery of confidence. This leads to a return of capital to the country of origin, a movement which constitutes an invisible export for that country. This inward flow of capital is often supplemented by an invisible export in the form of a new outburst of borrowing from foreign countries. In the period after the World War the United States loaned many billions of dollars to countries which had returned to gold. Such borrowing serves a necessary purpose, but it may be carried to excess. For instance, Germany has found it necessary to restrict such borrowing and to force domestic industry to rely upon local resources. In certain countries trouble has arisen not from excessive borrowing but from excessive lending. Thus England deemed it necessary to place an embargo upon foreign investments by her citizens during the transition period accompanying the return to gold.

It is apparent that a very wide variety of factors enters into the problem of maintaining the proper balance of international payments. The setting of the problem differs widely from country to country, and fixed rules cannot be laid down. This brief outline of certain factors involved is intended to suggest the nature of the problem in its broader implications.

Recovery from Speculation in Currency and Foreign Exchange.—According to the report of the Second Committee of Experts under the Dawes Commission:

> The chief methods by which Germans have acquired foreign assets since the Armistice has been by the sale of mark bank balances. We have been able to ascertain the net proceeds expressed in gold derived from the sale of marks. It is interesting to note that the foreign assets acquired in this way amounted to between seven and eight billions of gold marks, the whole of which in consequence of the final devaluation was lost by more than one million foreigners who at one time or another were buyers of mark credits.

Between the middle of 1919 and the end of 1923, France sold about 14.5 billion paper francs abroad to speculators. During the same period in Austria several hundred millions of gold crowns were sold abroad every year. What was true of these countries was true in various degrees of most countries which were in the throes of inflation.

A certain amount of speculation in exchange, as in any commodity, is a normal economic process; but under inflation the degree of speculation becomes excessive. The sale of a country's currency through the exchanges at such a time does not necessarily imply that the country is trying to perpetrate a swindle in the international markets. The process may be a more or less inevitable outcome of the deep-seated processes of unbalanced budgets and overissued notes.

An interesting variety of forms of speculation appears in the history of the post-War period. One form arises from the necessary process of buying and selling imports and exports of commodities. The dealers find that exchange rates fluctuate so rapidly that between the contract of sale and the completion of payment there is likely to be a heavy loss due solely to a change in the purchasing power of money. In order to protect themselves against this risk, dealers engage in forward buying of exchange. By this device they hope to obtain the means of future foreign payments at today's low rates of exchange. It was a common practice in many European countries after the War for importers to exchange domestic paper for foreign gold six months to a year in advance of the date when gold payments abroad would actually have to be made.

A second form of speculation was that engaged in by professional operators. Germany was able to sell marks abroad after the War because foreign speculators thought that within a short time exchange rates on Germany would improve. Later on, speculators abroad engaged in bearish operations on German exchange. Professional speculators inside the paper-money country buy heavily when they expect domestic exchange rates to rise and reverse the process when they expect them to fall. These operations are at times powerful enough to dominate the markets and to cause much more violent fluctuations than would otherwise take place. As the process of speculation becomes acute, it tends to become a mass movement. Every shop-keeper, peasant and working man finds that if he keeps paper money in his pocket it becomes worth less and less each successive day, but if he converts it into foreign currency it retains a fairly stable purchasing power. Later he may be able to reconvert the foreign assets which he has acquired into domestic paper at a profit.

This mass movement is closely associated with the "flight of capital." The phenomenon is well illustrated in Austria. De Bordes states:

> In 1921 and 1922 it was no longer the terror of Bolshevism, it was simply fear of a further depreciation of the crown which was driving everybody to buy foreign exchange at random. The whole population was infected with the movement. Just as every man of business made it his aim to create a bank account in Zurich, so it was the ideal of every peasant, domestic servant or grammar-school boy to possess a few dollars of Swiss 5-franc notes, or at least some Czechoslovak crowns.[1]

A further form of speculation arises when a country is forced to make reparation payments or other heavy payments abroad.

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[1] *The Austrian Crown*, 1924, p. 191.

The pressure to make cash payments on account of reparations was the primary factor in the tremendous sale of German marks during the post-War period. There are many authorities who maintain that if Germany had not been able to resort to this device she would have been forced to default on cash payments to the Allies.

All of these activities must be brought under control when a country decides to return to gold. As soon as exchange rates are definitely stabilized and inflation is curbed, the primary causes of speculation are wiped out. Speculation does not feed upon fixed exchange rates and stable prices. Under stable exchanges and prices, speculation automatically reduces itself to a very moderate and normal economic process.

The Restoration of Confidence.—The return to gold requires certain psychological foundations. During inflation, confidence has been undermined and a feeling of panic has become widespread. The restoration of confidence is not a matter of political fiat nor of patriotic exhortation. It is a matter of tangible steps in a fundamental program of reconstruction. As soon as the government demonstrates its power to balance the budget, restrict note issue, stabilize exchange rates and in other ways recover a specie standard, there automatically follows a rebirth of confidence on the part of the people. Hence, a country which waits for psychology to become favorable before deciding to return to gold may have to wait indefinitely.

The Central Bank Policy.—The return to gold involves numerous important functions which require the action of a central bank. This institution must accumulate reserves either in the form of gold at home or abroad, or in the form of liquid credits in foreign gold centers. It must refrain from making further advances to the government to be used for the purpose of meeting the fiscal deficit. It must provide sufficient elasticity in the volume of note issue to meet the changing needs of business and yet must restrict the quantity of issue sufficiently to avoid the possibility of internal inflation. It must maintain interest rates high enough to prevent a loss of gold reserve and yet not so high as to discourage commercial borrowing and bring about unemployment. It must establish credits in foreign centers to be used for the purpose of supporting the exchange whenever it is threatened with depreciation below the gold point, or of selling exchange whenever the opposite danger is faced. It will often be able to arrange international coöperation with the central banks of other countries with respect to relative discount rates or to control of gold movements between countries.

The Federal Reserve Banks in the United States have played a very important rôle in coöperating with the central banks of other countries during the period of their return to gold. It is only in recent years that a satisfactory conception of the duties of a central bank in these respects has been developed. After the Napoleonic Wars, the Bank of England was open to very severe criticism for its lack of sound policy. After the Civil War the National banks in the United States had no central bank through which to function. After the World War the European central banks, and particularly the Bank of England, were an indispensable agency in effecting the return to gold.

Gold Exchange Standard.—After the World War, in nearly all countries the first stage of return to gold was an arrangement known as the gold exchange standard. This arrangement was not new in its fundamentals. It was outlined quite clearly by Ricardo after the Napoleonic Wars in his famous essay on *Proposals for an Economical and Secure Currency.* The reason why the gold exchange standard commended itself strongly to nations after the World War was the relative scarcity of gold in the central banks of many countries. The gold exchange standard offered a device by which the fundamental advantages of the gold standard could be realized by a far-reaching economy in the use of gold. Gold was withdrawn from circulation and centralized in bank reserves. Part or all of the gold could be kept abroad at some financial center where it would draw interest but would be available on demand. In addition to actual gold, there were reserves of liquid credits abroad in the form of bank balances or readily marketable investments.

Redemption of paper currency in gold coin was dispensed with, and new devices had to be contrived by which to keep paper currency at a parity with gold monetary units. In some countries this requirement was met by providing for redemption of paper in gold bullion if the paper was presented in large lots. In other countries redemption took the form of a readiness on the part of the central bank to offer the note-holder sight drafts on gold in foreign centers. In some cases not even redemption in gold drafts was compulsory for a time, but parity between paper and gold was nevertheless maintained by the process of regulating the internal volume of currency and credit. This regulation involved restriction of the volume of note issue and maintenance of a sufficiently high rate of discount at the central bank. The gold exchange standard in various forms has demonstrated that it is possible to stabilize exchange rates and to keep paper currency at par with gold, even though the domestic gold stock is relatively small.

Foreign Loans.—Practically all countries which returned to the gold standard after the World War, floated so-called "stabilization loans." Proceeds of these loans were available for various purposes, but primarily for temporary balancing of the budget during the transition period, for support of the exchange rate in foreign markets, and for capital outlays necessary for the restoration of productive capacity. Such foreign loans were often subscribed to by a number of countries, and represented a high degree of international coöperation. When Poland returned to gold in 1927, six outside countries coöperated in a stabilization loan of $47,000,000 to the Republic of Poland and fourteen outside central banks coöperated in arranging credits for the support of Polish exchange.

Summary.—The great complexity of the problem of recovering a gold standard must be apparent. No simple formula will suffice. And yet, out of the experience of post-War periods since 1815, there have been built up a group of standard concepts and principles which make possible an effective handling of the problem. The return to gold after the World War was facilitated by the fact that most countries possessed central bank organizations and that through these central banks an unprecedented degree of financial coöperation could be realized. Old principles of economic action combined with new institutions and new standards of procedure account for the ability of the various countries to pull themselves out of the despair of inflation and to regain stable monetary conditions.

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Chapter XVII

MONEY AND PRICES IN ENGLAND SINCE 1913

Inflation of Currency and Credit.—On August 1, 1914, the day on which Germany declared war on Russia, England suspended the note restriction clause of the Bank Act of 1844, thereby permitting an expansion of Bank of England notes backed by government securities. Prior to this suspension the maximum of bond-secured notes under that Act was £18,450,000. However, the fiduciary issue of bank notes was resorted to only as a temporary expedient. To meet the more permanent currency requirements, a new form of government note was created, commonly known as the currency note, or Bradbury. The Act authorizing the new currency notes was passed on August 6, 1914. As soon as these notes could be printed and made available they were substituted for the Bank of England notes which had been issued by suspending the Act of 1844.

The currency notes were put into circulation by having the Bank of England place them at the disposal of the joint-stock banks, post-office savings banks, and treasury savings banks. They were a floating charge on the assets of such banks, superior to all other claims, and bearing interest at the current bank rate. The banks were allowed to obtain a volume of the new notes up to 20 per cent of their liabilities arising from deposits and current accounts. The notes were full legal tender and were issued in denominations of one pound sterling and of ten shillings. The Bank of England notes had been issued in denominations of not less than five pounds sterling. The currency notes, by virtue of their small denominations, rapidly displaced gold in circulation and facilitated a concentration of gold in the reserves of the Bank of England. The gold concentrated in this manner served as a basis not only for the issue of additional Bank of England notes backed pound for pound by gold, but also for the increase of bank deposits. In other words, the new currency notes, by displacing gold in circulation, paved the way for a marked expansion of both note issue and bank credit, and for consequent inflation of prices. The increases in gold reserves, notes in circulation, and bank deposits, are shown by the following table:

TABLE I

End of Year	Gold Coin and Bullion of Bank of England	Notes in Circulation	Deposits of Joint-Stock Banks of England and Wales
1913 . .	£34,983,000	£28,608,000	£809,352,000
1920 . .	128,268,000	481,027,000	1,961,527,000

Abandonment of the Gold Standard.—Formally and officially there was never an explicit abandonment of the gold standard in England during the War period. However, in effect, the gold standard ceased to exist as soon as war was declared in August, 1914. At the outset there was a general understanding that it was unpatriotic to ask for the redemption of notes in gold at the Bank of England, or to export gold from England to foreign countries. On May 10, 1917, the export of gold from England was prohibited by proclamation. The melting-down of gold was forbidden in 1916. The patriotic restraint against specie redemption, combined with the prohibition against the melting-down of gold for use in the arts and the restriction of the export of gold, left England on the gold standard in name only.

The embargo on gold exports was continued by Orders of Council April 1, 1919 and November 6, 1920. According to a law passed at the end of 1920, the exportation of gold and silver was prohibited until December 31, 1925. However, any gold and silver that had been produced in British Dominions could be imported and thereafter reëxported under license given by the Board of Trade. Under this provision, practically the same amount of gold was reëxported as was imported from various divisions of the British Empire, principally from South Africa.

Gold in Reserves and in Circulation.—During the War and post-War period, gold in circulation was largely dispensed with, and the need for hand-to-hand currency was met by currency notes and bank notes. The total stock of gold in England in 1913 may be estimated at about £270,000,000 of which about £200,000,000, was in public circulation and the balance in the joint-stock banks and the Bank of England. In 1925, the total stock was about £157,000,000, all of which was in the hands of the Bank of England. In spite of net exports of gold between 1913 and 1925 amounting to about £120,000,000, the gold reserves of the Bank of England increased from about £34,900,000 to about £157,000,000.[1]

While central reserves were thus increasing about 4½ times, total note circulation was increasing about 14 times, and total deposits of the Bank of England about 2½ times. The result of these changes is measured by the ratios of gold reserves to total notes and deposits. This ratio for the Bank of England in 1913 stood at about 36 per cent and in 1925 at about 22 per cent. The changes measured by these ratios represent a far-reaching revolution in the monetary structure of England. The centralization of gold in reserves constituted a large economy in the use of that metal and enabled England to return to a gold basis in 1925, in spite of the fact that the country's total stock of gold had shrunk more than one-third since the beginning of the World War.

The Dispersion of Prices.—According to the *Statist* index of wholesale prices, the peak of inflation was reached in April, 1920, with an index of 313 (adjusted to a base of 1913 as 100). In order to understand the significance of this general average, it is necessary to analyze the inequalities of price increase among the commodities which enter into the average. Such inequalities are shown by the following table of monthly price indexes for 1920, using January to June, 1914, as base of 100:

TABLE II

1920	Cereals and Meat	Other Food Products, etc.	Textiles	Minerals	Miscellaneous
January	259	245	430	250	273
February	258	253	469	258	287
March	266	261	*472*	257	*304*
April	265	259	467	254	294
May	263	*280*	448	267	288
June	268	266	407	266	277
July	265	267	412	270	274
August	254	265	401	269	277
September	266	265	376	270	274
October	*276*	257	310	*271*	257
November	261	248	262	260	238
December	238	230	204	251	227

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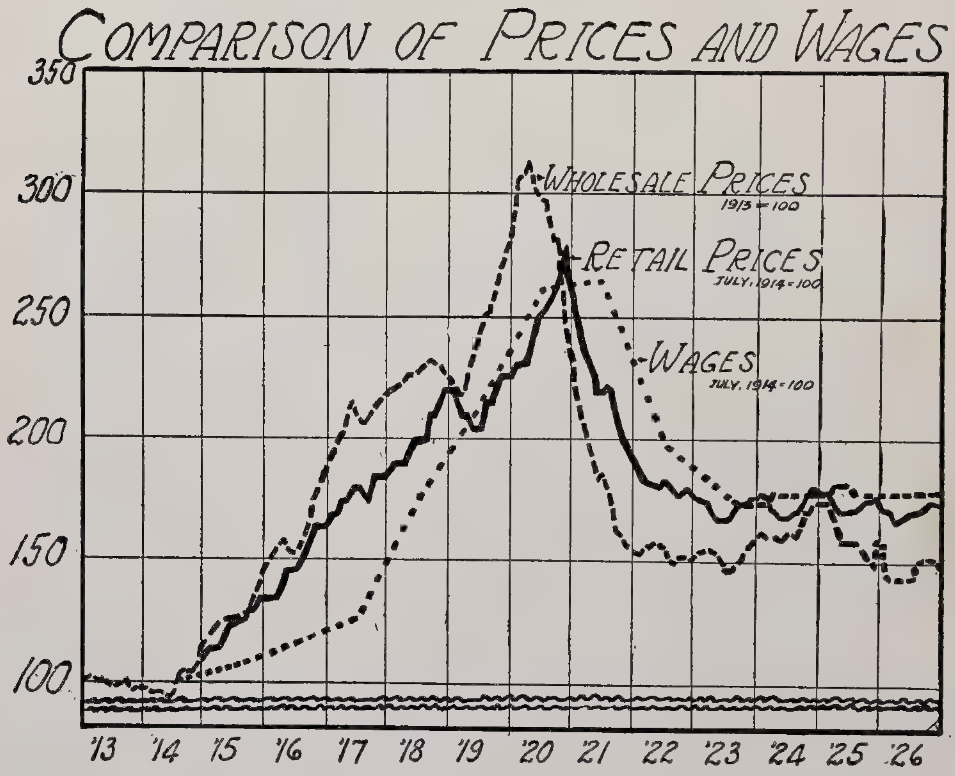
[1] W. A. Shaw, *Currency, Credit, and the Exchanges*, 1927, pp. 30–42.

Prices of textiles rose to an index of 472, whereas prices of minerals rose only to an index of 271. More extreme differences would be found if individual commodities were taken instead of groups of commodities. The dispersion of prices was wide owing to two basic causes: first, the per cent of change in the price level was very great; second, the quickness with which this per cent of change was accomplished was altogether extraordinary. A large change in a short period of time led to an excessive dispersion of prices.

CHART NO 21



This dispersion was accentuated by the price-fixing policies of the British government. In general, prices of controlled articles rose less sharply than prices of noncontrolled articles. However, after the control was withdrawn, there was a readjustment of price dispersion along wholly new lines determined more completely by natural factors of supply and demand of commodities. The price-fixing policies of the government materially shifted the natural channels of price dispersion.

Price dispersion introduced unusual difficulties for business

Extremely high prices in certain lines were conducive to overinvestment of capital in those lines, and relatively low prices in other lines were conducive to a flight of capital from those industries. Many industries whose prices had not risen excessively had to buy raw materials from industries where prices had gone to extraordinary heights. The dislocation of industry caused by such price disturbances was far-reaching and eventually contributed to the collapse of prices at large. In brief, it was not only inflation of prices which characterized this extraordinary period, but inflation accompanied by extreme price dispersion.

Government Price Fixing.—As soon as War operations began, various forms of price control were introduced. At first, price regulations applied only to the most essential commodities, and the regulations were more a matter of mutual agreement between the government and business than of arbitrary action by the government alone. Gradually, however, the control became more drastic and comprehensive until by 1918 the great bulk of essential commodities was subject to arbitrary price restrictions. The administrative machinery of control consisted of the Board of Trade, a special food controller, a special coal controller, and numerous other special committees and bureaus.[1] In addition to this controlling mechanism at the top, there were numerous local committees which coöperated in estimating fair prices and in enforcing the regulations of the powers higher up.

In general, three distinct methods of price fixing were utilized:

First, the government bought outright the supply of an article and distributed it in Great Britain at prices which, in some cases, involved a loss to the government, and, in other cases, involved a profit. Sugar and wheat, for example, were controlled in this manner.

Second, the government fixed a price, usually a minimum as well as a maximum price, and if cost of production exceeded the minimum, the government subsidized industry by the amount of the deficit. Coal and iron, for instance, were controlled in this manner.

Third, the government fixed a price subject to revision from time to time, but without obligation to subsidize industries which suffered a loss. Meats and butter, for instance, were regulated in this manner. This third form of control corresponded rather closely to the form which was most frequently utilized in the United States.

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[1] Litman, Simon, *Prices and Price Control in Great Britain and the United States During the World War*, 1920.

The results of price control were far-reaching. These results may be analyzed under the following headings:

(a) *Effect on Production.*—Prices had to be placed high enough to enable producers to turn out the volume of the product necessary to meet the needs of the country. The minimum price fixed on numerous articles was calculated to induce adequate production. However, it proved very difficult to gauge the exact price scale which would serve this purpose, and many mistakes were made. In the course of time, the control over production was made fairly effective, but during the early years of experimentation, there was much uncertainty and loss both to producers and to the government.

(b) *Effect on Consumption.*—Maximum prices were intended to prevent profiteering through overcharging consumers. The device was doubtless useful for this end, and prevented a more rapid increase in the cost of living.

(c) *Effect on the Taxpayer.*—The numerous subsidies which had to be granted and the burden of administrative costs constituted a heavy toll upon the taxpayer. Although, on the one hand, the consumer was often saved from paying a high price, nevertheless, on the other hand, he was assessed a high tax to compensate the producers for being forced to sell at a low price. Consequently, in many cases, there was probably no net gain to the individual from the price-fixing mechanism.

(d) *Effect on Imports and Exports.*—In order to control prices, it was necessary to control supply. Since supply was, in most cases, international, this made it necessary to control imports and exports. In some cases, the British government coöperated with other governments in purchasing outright a large part of the world's supply of commodities. This practice was illustrated in the international purchasing of wheat. In other cases, it was necessary to forbid imports of a commodity or to forbid exports.

(e) *Effect on the General Price Level.*—The price restrictions doubtless acted as a check upon the inflationary tendencies of the period. After the price restrictions were removed, prices climbed to new heights. However, very few authorities at the time showed any clear understanding of the relationship between price-fixing and the fiscal policy of the government. Fiscal policy rested upon additional currency and additional bank loans. These increased quantities of money and credit contributed to a sharp inflation of prices. Instead, however, of facing this cause and effect relationship, most officials appear to have assumed that the rise of prices was due solely to War demand or War scarcity of the articles. Believing this, they further assumed that price increases were animated by profiteering motives. Consequently, they assumed that their duty was to halt profiteering by arbitrary orders.

Accordingly, at the very time when the government, by its fiscal policy, was forcing inflation upon the country, the government, through another branch, was trying to defy the irresistible forces of inflation by arbitrary rulings on maximum prices. There was no coördination, in other words, between fiscal policy and price-fixing policy. Whereas the Treasury Department, in order to finance the cost of War, was following policies destined to raise the general price level, the food controller and the other controllers were trying to stem the tide of inflation by dictatorial regulations on individual prices.

Wholesale Prices, Retail Prices, and Wages.—The chart on page 356 compares fluctuations in wholesale prices, retail prices, and wages. Retail prices lagged behind wholesale prices during the great upward movement from 1914 to 1920, and likewise lagged behind wholesale prices during the great deflation of 1920. Wage rates lagged behind retail prices during the early years of the War, but later they advanced at a more rapid pace.

Wage rates do not, however, give a satisfactory indication of labor incomes. This difficulty arises from such disturbing factors as a reduction in the length of the working week, an increase in the number of the gainfully employed per family, a variation in the amount of overtime and part-time work, and a variation in the amount of unemployment. When all elements are considered, we may estimate that the real income of the average family was not less, and was probably slightly more, at the beginning of 1920 than in 1914. When deflation set in during 1920, wage rates fell less rapidly than retail prices, but owing to widespread unemployment and part-time employment, real income per family was for a time probably somewhat below the pre-War level.

Although the general average of wage rates and labor income is significant, the average should be interpreted in light of the inequalities of change among the constituent labor groups. In many trades skilled workmen received increases out of proportion to those received by unskilled workmen. In some trades the government intervened to adjust wages by a sliding scale to meet changes in the cost of living. In some trades wages of women were advanced nearer to a parity with men's wages than in others. As between numerous individual branches of industry, War demand caused very rapid advances of wage rates in some lines and retardation of rates in others. In some trades labor unions had greater power to boost wages by collective bargaining than in others. All such inequalities brought extraordinary prosperity to some classes of labor and inflicted unmerited hardship on other classes. They engendered friction and unrest throughout the ranks of labor and multiplied the obstacles to coöperation and efficiency between employers and employees.

Budgeting and Fiscal Policy.—The three primary methods of raising war-time revenues are as follows:

(1) Taxation
(2) Borrowing
(3) Note Issue

The relative emphasis upon one method or another has significance from the standpoint of the movement of prices. Great Britain raised approximately 25 per cent of her expenditures from 1914 to 1919 by taxation. This was a higher percentage than that attained in any of the other European belligerents. The following table (p. 361), shows year by year the ratio of British taxes to British expenditures.[1]

During the early months of the War, all authorities underrated the probable duration of the struggle. Consequently, the country was slow to realize the enormity of the tax burden that was to be borne. However, by 1915, income tax rates had been practically doubled and a 50-per-cent tax on excess profits had been imposed. Eventually the tax rate on excess profits was raised to 80 per cent. Internal excise taxes on beer, tea and many other articles of consumption were sharply raised, and import duties on numerous articles were advanced. Amusements of all sorts were heavily taxed. The manner in which these changes

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[1] Bogart, E. L., *Direct and Indirect Costs of the World War*, 1919, p. 20.

TABLE III

RATIO OF TAXES TO EXPENDITURES
(IN THOUSANDS OF DOLLARS)

Year	Expenditures	Taxes	Ratio Taxes to Expenditures
1914	$987,465	$810,145	82.5
1915	2,802,367	946,525	33.6
1916	7,795,791	1,450,440	18.6
1917	10,990,563	2,570,540	23.4
1918	13,481,107	3,065,200	24.8
1919	13,896,506	3,920,390	28.1
	$49,953,799	$12,763,240	25.5

added to tax receipts is shown by the following table, comparing tax revenues of the pre-War fiscal year ending March 31, 1914, with those of the fiscal year ending March 31, 1919.[1]

TABLE IV

TAX REVENUE, 1914 TO 1919
(IN THOUSANDS OF DOLLARS)

Fiscal year ending March 31

Source	1914	1919
Customs	$172,250	$513,900
Excise	197,950	297,200
Estate duties	136,795	151,310
Stamps	49,830	61,190
Land tax	3,500	3,150
House duty	10,000	9,250
Property, income, supertax	236,245	1,455,930
Excess profits	....	1,425,140
Land value duties	3,575	3,320
	$810,145	$3,920,390

The main reliance for increased revenues was upon income and excess profits taxes. Taxes which would have checked extravagant consumption were applied slowly and mildly. Doubtless Great Britain could have met a larger part of the War cost out of current taxes if her statesmen had formulated a definite plan of taxation. Such a plan they did not have. From one year to another, they improvised tentative plans and snatched at useful expedients. But a comprehensive, forward-looking program of taxation was wanting. Had such a plan been evolved, the British could and should have borne a heavier burden of War cost by taxation.

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[1] *Ibid*, p. 38.

The reliance upon government borrowing resulted in raising the national debt of Great Britain from about $3,400,000,000 on March 31, 1914, to more than $37,000,000,000 on March 31, 1924.

The debt load was further complicated by international borrowings. By December, 1923, the British debt included about $4,577,000,000 owed to the United States. In addition, the British had resold abroad during the War period about $4,000,000,000 of their foreign investments. On the other hand, Great Britain reloaned heavily to the Allies and Dominions. Such loans amounted to about $6,917,000,000. Not all of these loans were recoverable, according to some estimates, not more than 50 per cent.

The forms of debt included exchequer bonds (3 and 5 years), national War bonds (5, 7 and 10 years), long-term bonds (11 to 30 years), short-term treasury bills (3 to 12 months), and direct advances to the government on "ways and means" by the Bank of England derived largely from the currency notes fund.

In part, these loans were subscribed out of savings, and in so far as this was the source, no inflation was caused. However, savings were not by any means the only source of subscriptions. A second very important source was bank loans.

In some cases, the government borrowed directly from the Bank of England, in which event additions were made to the credits and deposits of the Bank. In other cases, the government borrowed from the joint-stock banks. In still other cases, the government borrowed from the people, who in turn borrowed from their banks part or all of the amounts which they subscribed for War bonds.

As an accompaniment of these nonsaving forms of government borrowing, there were sharp increases in the volume of bank credit and currency. These increases are indicated by the following table:

TABLE V

CREDIT AND CURRENCY EXPANSION

End of Year	Total Deposits of Bank of England	Deposits, Joint-Stock Banks of England and Wales	Note Issue Outstanding	Price Index
1913	£71,344,000	£809,352,000	£29,608,000	100
1914	154,988,000	895,561,000	74,617,000	108
1920	189,859,000	1,961,527,000	481,027,000	243
(Apr. 1920)	140,381,000	....	438,661,000	313

The penalty for excessive creation of currency and credit was price inflation. During the War, most people in England were unwilling to admit this cause-and-effect relation. It was more plausible to attribute inflation to War scarcity, War demand, higher costs of production, and profiteering. All of these forces were real, and served to stimulate price inflation. But the inflation that could have been created by all these forces would have been halted quite early, if credit and currency had not been unduly swollen. Government borrowing, by relying upon fresh creation of credit and currency, aided and abetted the dangers of inflation, and directly promoted its harmful tendencies.

After 1920, the national budget was made to balance. As soon as current receipts were made equal to expenditures, the urgent cause of inflation disappeared. It was no longer necessary to issue currency notes and swell bank credits in order to pay the government's expenses. Throughout the period, inflation had been directly correlated with government fiscal policy. It had been an adjunct of the general policy of balancing the budget out of new loans and note issues rather than out of savings.

Fluctuations of Money and Commodity Prices.—The accompanying chart presents a comparison of the movements of wholesale prices, notes in circulation, and bank deposits.[1] Although a general similarity is apparent, precise comparisons to discover the sequence and amplitude of the various series are difficult. This difficulty arises from limitations in the data themselves. For instance, the data on note circulation indicate a higher percentage of increase than do those on wholesale prices; but this disparity is largely due to the fact that a large part of new notes were not a net addition to circulation but were merely a substitution for gold coin withdrawn from circulation. The net addition to circulation month by month is impossible to estimate owing to the fact that records of monthly withdrawals of gold are lacking. In spite of this difficulty, we can observe a tendency for note issue to precede price increase during the early years of the War. J. S. Nicholson finds for these years a three-months' lag of prices behind note issue.[1] During 1918, prices rose very slowly, whereas note issue nearly doubled. In 1919, note issue preceded the price advance, but in 1920, note issue continued to advance for several months after prices had crossed their peak. Moreover, the ultimate decline in note issue was small relative to that of prices. From this outline of price history, one finds no support for the view that M uniformly preceded and was the cause of subsequent changes of P. However, one does

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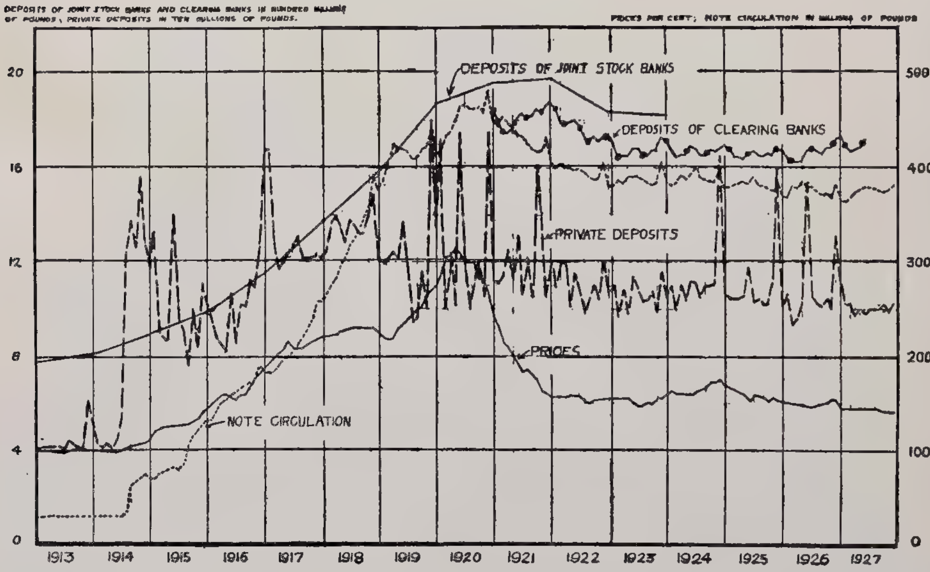
[1] Prices are measured by the Statist wholesale index, adjusted to 1913 as a base of 100. Note circulation is currency notes plus Bank of England notes, exclusive of bank notes in currency reserve. Private deposits are deposits other than government at the Bank of England. They roughly measure the dependence of the joint-stock banks upon the Bank of England for cash and reserves. Deposits of clearing banks are total deposits of ten London clearing banks. Since the data are not available prior to January 1921, deposits of all joint-stock banks as of the end of the year have been used to carry the record back to 1913.

CHART NO 37

ENGLAND - PRICES, NOTES AND DEPOSITS



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[1] *War Finance*, 1917, p. 108.

find ample evidence that note issue was in part a causative factor and in part a conditioning factor in price inflation. It was causative in that the injection of new spending power into the hands of the public induced the public to bid up the prices of goods and services. It was causative also in that the new currency and credits utilized by the government brought the government into commodity markets as a large-scale buyer of goods, and added government demand to the already aggressive private demand. But it was not the only causative factor of fundamental importance. The scarcity of goods, the fiscal policy of the government, the international trade situation, and the temper of the business community were of very great significance. However, even when price advances were initiated by these other factors, note issue was a conditioning factor. A price advance could not go very far unless note issue was expanded. Note issue limited and restricted price increases instigated by nonmonetary influences.

Further difficulty in interpreting data may be illustrated by the records of deposits of the joint-stock banks. Prior to 1921, the records give only end-of-year figures. Monthly data are not available. The chart shows that the year-to-year increase of deposits synchronized rather closely with the rise of prices, but lagged considerably behind the fall of prices. The record of private deposits of the Bank of England is difficult to interpret because of the obvious irregularities of the data. Nevertheless, it is evident that they preceded prices on the rise, reached a turning point slightly in advance of prices in 1920, but fell in succeeding years proportionately less than prices.

This much is clear,—the great inflation which culminated in 1920 was facilitated and made possible by the increases of notes and deposits. It is of minor consequence whether M preceded P or P preceded M. The expectations and anticipations of the public are so important in regulating their demand for money that often the value of money changes before the causal factor actually materializes. The significant and underlying principle is that prices and note-deposit inflation interacted upon each other, and that both in common were interrelated with important outside factors of industrial, political, and psychological character. Although this inference is plausible enough now, it was stubbornly fought by the public and by officialdom in England throughout most of the inflationary period. The protests of a few economists that rising prices were due to note-deposit over expansion were a voice crying in the wilderness. The preponderant opinion stoutly maintained that more money was necessary in order to do business on the new price level, but that the new money was in no sense a cause of high prices. The real cause was sought for in profiteering, scarcity of goods, high wages, consumer extravagance, and a host of other phenomena. "It is almost incredible now, but it is a fact that everywhere most of those who were regarded by the public as monetary experts refused to believe that the paper issues of their own particular country had anything to do with the rise of prices in that country." [1]

The tide of official opinion shifted toward the end of 1919 and 1920, and this reversal contributed in important ways to the great deflation which began in the spring of 1920. Let us consider the setting of the price problem in this immediate period. A world-wide business and speculative boom had gone to extreme lengths. Labor unrest in England had become acute. Price dispersion had reached extraordinary extremes. A feeling of uneasiness had begun to take hold of the more far-seeing leaders of business and of government. In this general setting, certain monetary policies were instituted which looked definitely in the direction of calling a halt to inflation. One of the first positive steps was the Treasury Minute of December 15, 1919, limiting the fiduciary issue of currency notes in any given year to the maximum issue of the preceding year. This restriction of cash meant that the banks must restrict their loans and deposits in similar degree. Indirectly, therefore, this Treasury Minute was a signal for caution and conservatism all along the line. It had much the same effect as a gold drain would have had under the pre-War gold standard. The discount rate of the Bank of England had been 5 per cent throughout 1919 until November 6, when it was advanced to 6 per cent. By April 15, 1921, it had been advanced to 7 per cent. Moreover, the government took action calculated to reinforce these restrictive measures. The official action has been described as follows by Walter Leaf, Chairman of Westminster Bank Limited, and from 1919 to 1921 President of the Institute of Bankers:

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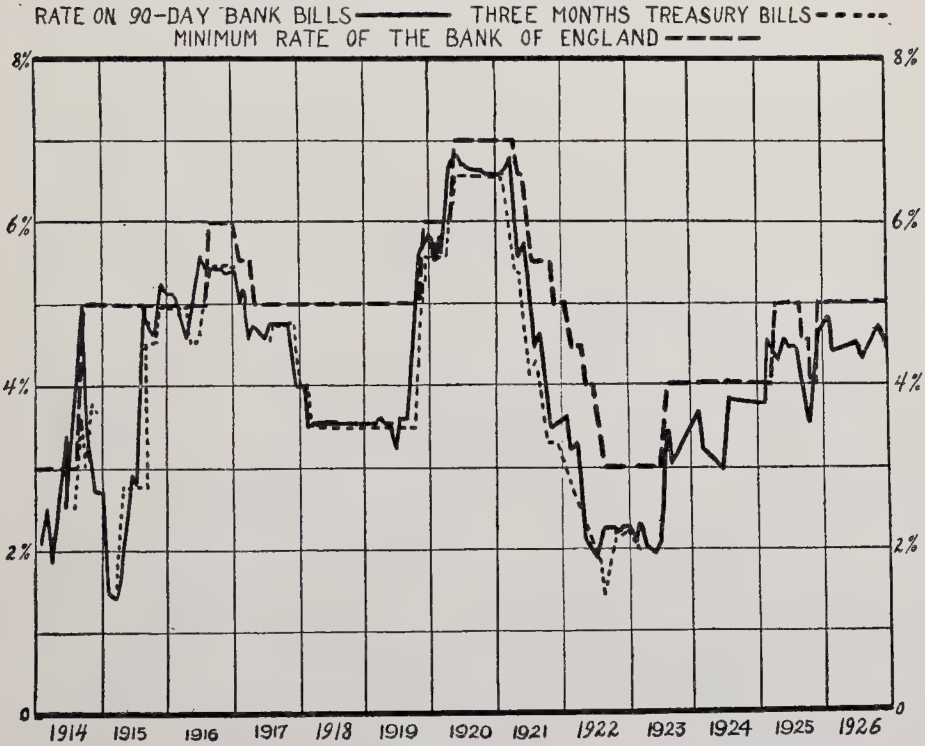
[1] Cannan, Edwin, *An Economist's Protest*, 1927, p. x.

The great restriction of credit and fall of prices which took place in 1920-2 was brought about in this manner. The banks were approached and received an intimation that the Government had adopted a policy of deflation, and the banks were invited to support it by curtailing their credit facilities. The Government took the matter in hand. They deflated rapidly by very large repayments of public debt, involving reduction in the outstanding issues of Treasury notes and in the floating debt generally, and the Bank of England, on April 15, 1920, raised its rate of discount to 7 per cent. The effect was immediate, prices dropped, everyone rushed to realize assets, the value of securities pledged to the banks fell. But the effect on bank advances was much more gradual. It was not until 1922 that the full effect of the Government policy showed itself here. In that year the total advances, discounts, acceptances, and endorsements of the banks had fallen by £140,000,000.[1]

CHART NO 23

INTEREST RATES IN GREAT BRITAIN



Although this quotation accurately describes the intent of the government and banks, nevertheless the reader should bear in mind that the effectiveness of the policies pursued depended upon the state of trade at the time. A world-wide price decline set in at the same time that price deflation was precipitated in England. An industrial cycle had accumulated stresses and strains which were undermining prosperity from within. The mental attitude of the public had become expectant of a price disturbance. In this stage setting, monetary restrictions brought inflation to a halt and helped to produce a subsequent liquidation and deflation of unusual severity.

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[1] *Banking*, 1927, pp. 173–175, 205–208.

Interest Rates.—Interest rates were kept low in order to enable the government to borrow cheaply. With interest rates low, it was thought that the burden of taxation necessary to meet interest charges could be kept relatively small. The rate on Treasury bills was the most sensitive index of rates on government loans. As shown by the accompanying chart, the rate on Treasury bills fluctuated around 5 per cent during 1915 and 1916, fell to 3½ per cent during the greater part of 1918 and 1919, and shifted to a high point of 6½ per cent during 1920 and a low point of 1½ per cent in 1922. The rate of discount at the Bank of England was made to harmonize rather closely with the rate on Treasury bills. Because of this policy, the Bank of England ceased to occupy the position of an independent regulator of its discount rate. The Bank was subordinate to the Treasury, and was not free to use its influence to set the market rate at a level which would have reflected the true scarcity of capital.

One evil consequence of the artificially low rates was the temptation to all kinds of nonessential industries to engage in unusual capital expansion. In order to curb this tendency, the government subjected private capital issues to arbitrary control. Private industry was put on starvation capital rations in order that public loans might practically monopolize the savings of the country. The effect of this control is evident from the following table on page 369.[1]

The most damaging consequence of low interest rates was overissue of credit and currency and the associated rise of prices. The low rates definitely encouraged the tendency of private commercial interests to borrow to excess. The market rate, the Bank rate, and the Treasury bill rate were closely linked together, and were all alike contributing factors to the expansion of the means of payment and the rise of prices.

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[1] London Joint City and Midland Bank circular, January, 1921.

TABLE VI

NEW CAPITAL ISSUED

Year	Millions of Pounds Sterling	Index Numbers (1913 = 100)
1913	242	100
1914	200	82
1915	83	34
1916	35	14
1917	26	11
1918	65	27
1919	238	98
1920	384	159

When the consequences are fully considered, the low rates were not defensible even from the standpoint of fiscal economy. When prices doubled, twice as much money had to be borrowed, and twice the quantity of interest paid. The rate may have remained low, but the total amount of interest greatly increased. Low rates helped to push the price level up, and the swollen loans necessary to do business at the higher levels magnified the interest burden greatly. It was at best a short-sighted economy which tried to save the government money by floating cheap loans. In the long run, the so-called cheap loans were the dearest form of loans imaginable.

Government borrowing involved foreign as well as domestic sources of funds. The government desired to increase foreign loans to England and decrease English loans to foreigners. Prohibition of export of capital, sale of English foreign investments to foreigners, and preferential rates of interest offered on foreign funds, were used to accomplish the government objective.

Under normal conditions, the Bank of England rate of discount had always been used to protect the gold reserves against excessive exportation and to correct abnormal fluctuations of foreign exchange. Under War conditions, this use of the Bank rate was largely eliminated. Gold exports were directly controlled by government embargo, and exchange rates were arbitrarily "pegged" [1] by the government. Under these conditions, the Bank rate lost its usual regulative function with respect to gold movements and exchange rates.

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[1] See below, p. 371.

Following the War, the low interest rates were an important factor in stimulating a business boom and a strong commercial demand for funds. The money market tightened during the latter half of 1919, and interest rates, being to a substantial extent freed from the exigencies of War finance, rose to a level approximately double that of the last War year. The Bank of England resumed its independent position in the money market and advanced the Bank rate to a point calculated to restrict the great speculative movement of 1920. The turning point from inflation to deflation occurred in the spring of 1920, but interest rates did not fall until about a year later. The rôle of the Bank of England in these events has been stated by Sir Charles Addis, speaking before the Institute of Bankers in 1921, as follows:

> The experience of the past three years has gone to demonstrate once more the effectiveness of the Bank rate, even when the gold standard is practically suspended, as an instrument for contracting speculative credit and reducing the inflation of prices.

Exchange Rates.—During the first few months after the outbreak of the War, the urgent demand for funds in England led to a heavy liquidation of that country's holdings of foreign securities and a transfer to London of all available liquid resources abroad. The pressure upon exchange rates resulting from this invisible export factor led to a sharp increase in the demand for sterling exchange in New York and a rise in the New York quotations of the pound sterling. The movement of exchange is shown on the accompanying chart.

The transfer of capital was accomplished within the space of a few months, and by the latter part of 1914 the balance of trade was the dominating factor in exchange rate movements. England purchased large quantities of War supplies from foreign countries. The resulting adverse trade balance led to an abnormal increase in the supply of sterling bills in New York and to a decline in New York quotations of the pound sterling. Under normal conditions, a flow of gold from London to New York would have taken place, but under the abnormal War conditions prevailing in 1914 and 1915 the free movement of gold was arbitrarily restricted. Lacking the corrective of a specie flow, the exchange rate fell in New York to about $4.67, a level well below the specie import point. Early in 1916, the government intervened to prevent the pound sterling from further depreciation. This intervention took the form of "pegging" the rate, by arbitrary control, at $4.76. The pegged rate remained in effect until March, 1919.

This artificial fixing of the exchange rate was carried out by means of loans negotiated in the United States through J. P. Morgan and Company and by means of credits obtained through sale of British-owned American securities. The British government, in order to obtain funds in the United States, borrowed or purchased at a premium all available American securities held in Great Britain, and imposed a special tax on privately held securities of the desired type so as to insure their being turned in to the government. With the funds so obtained, the New York agents of the British government went into the exchange market and bought up whatever volume of bills was necessary in order to sustain the rate at about $4.76. It is estimated that during 1918 the average weekly purchases of sterling bills in New York by Great Britain amounted to about $40,000,000.

The maintenance of the exchange rate at an artificially high point had the twofold effect of making British imports cheaper and British exports dearer than they otherwise would have been. Since Great Britain was primarily concerned at this time with the cost of her enormous imports, the fact that the "peg" lowered the cost to British merchants of goods imported into Great Britain had great significance.

The chart on page 372 compares the actual rate of sterling exchange with the estimated purchasing power parity. This parity is computed by multiplying the mint par, $4.8665, by the United States wholesale price index for any given month and dividing this product by the British wholesale price index, (both price indexes being expressed on 1913 as a base of 100). The resulting purchasing power parity is the rate of exchange at which the pound sterling would have bought an equal amount of goods whether spent at home or in the United States. It is the rate which equalizes the purchasing power of money in two countries of unequal internal price inflation. (For further explanation of the purchasing power parity see pp. 438-439.)

As long as exchange was pegged, the actual rate held far above the purchasing power parity. In this relationship, the pound had a greater purchasing power abroad than at home. After the peg was removed in March, 1919, exchange rates were free to adjust themselves to actual market conditions. The actual rate swung into line with the purchasing power parity, and, with limited deviations, moved closely with that parity until the return to a gold standard in 1925. The purchasing power parity itself fell rapidly in 1919 and 1920, and reached a low average in January, 1921, of $3.5662. This fall reflected the sharp inequality of price inflation in the two countries. As an incident of the depression of 1920-1922, the price level fell more sharply in Great Britain than in the United States, thus returning to an approximate equality with the United States index and bringing the purchasing power parity up to close proximity to mint par.

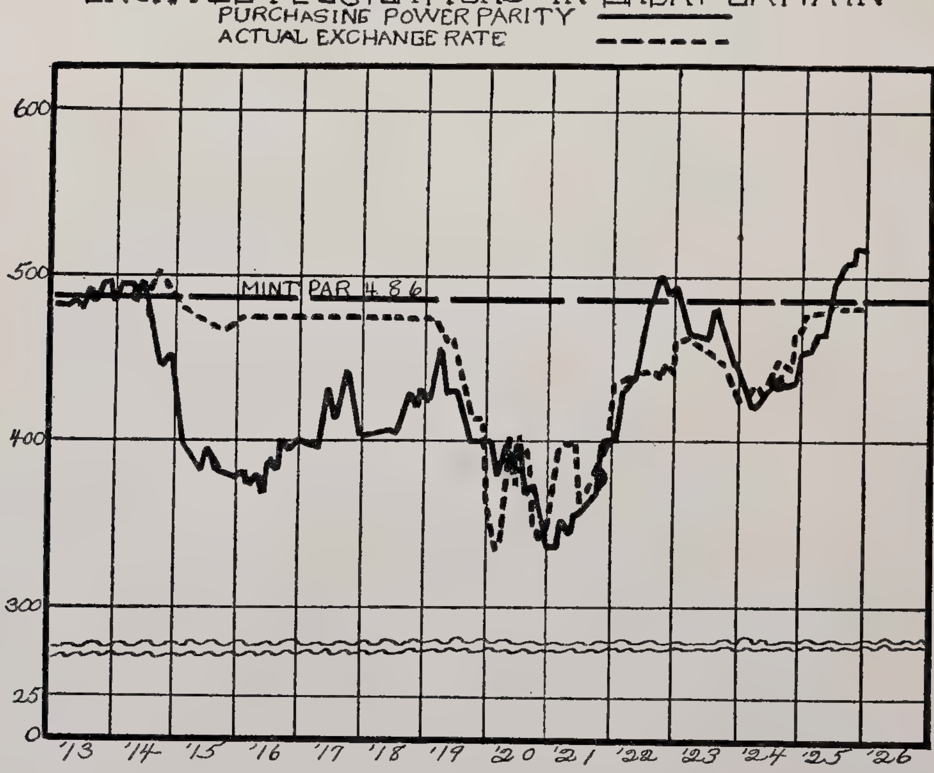

CHART NO 24

EXCHANGE FLUCTUATIONS IN GREAT BRITAIN

The fluctuations in purchasing power parity should be distinguished from the deviations of actual exchange rates from that parity. The parity itself registers the inequalities of inflation in the two countries. The deviations from parity reflect adverse trade balances, changed political conditions, and the speculative outlook. As long as actual rates approximately coincide with purchasing power parity, there is no disturbing effect on trade. But such coincidence was highly uncertain. Great instability of market rates prevailed, and this instability added excessive risks to commerce. It was the determination to escape this instability which reinforced England's policy to return to the gold standard as rapidly as possible.

Preparation for Return to the Gold Standard.—After the War, there was much discussion in Great Britain of financial reconstruction. The preponderance of opinion leaned in the direction of a return to the gold standard as rapidly as possible. The policy of the government from the first was in harmony with this opinion.

Before the gold standard could be restored, however, it was necessary that certain foundations should be established. It was necessary, for instance, that the fiduciary issue of currency notes should be contracted. On December 16, 1919, the Chancellor of the Exchequer announced that the fiduciary circulation of currency notes, that is, the amount of currency notes outstanding not covered by gold or Bank of England notes, should be limited in any one year to the maximum fiduciary circulation of the previous year. For 1920, this maximum was fixed at £320,600,000, this sum being the largest fiduciary circulation reached during 1919. By 1925, the maximum had been lowered to £248,145,000. This deliberate contraction of the currency aided in the general policy of price deflation which was necessary before the gold standard could be readopted.[1]

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[1] The Cunliffe Committee, reporting October 29, 1918, recommended that the currency notes, which were government notes, should in due time be amalgamated with the notes of the Bank of England and so become obligations of the Bank rather than of the government. "We recommend," so reads the report, "that the note issue should be entirely in the hands of the Bank of England." But the Committee frankly recognized that before this objective could be reached, the gold reserve of the central bank would have to be augmented and the amount of fiduciary currency notes would have to be contracted. The report says, "When the fiduciary portion of the issue has been reduced to an amount which experience shows to be consistent with the maintenance of a central gold reserve of £150,000,000, the outstanding Currency notes should be retired and replaced by Bank of England notes of low denomination." The Committee on the Currency and Bank of England Note Issue, whose report in 1925 was a prelude to England's return to a gold basis, made the recommendation, subject to minor qualifications, that "The policy with regard to the transfer of the Currency note issue to the Bank of England should remain as recommended by the Cunliffe Committee." Furthermore, they anticipated that the amalgamation of note

Not only was it necessary to contract currency issue, but also it was necessary to contract bank loans and deposits. As soon as the requirements of War financing had become a thing of the past, the Bank of England resumed its normal position as regulator of the rate of discount. It made the rate relatively high, and by so doing, discouraged unnecessary credit and stimulated a reduction of loans and deposits wherever possible.

In order to carry out these policies of contraction, it was necessary that the national budget should balance. Current revenues were maintained at a high level, and expenditures were curtailed. As a result, not only was the budget balanced, but sufficient surplus funds were accumulated to reduce the floating debt of the nation. This reduction from the end of 1920 to the end of 1924 amounted to £560,000,000. The elimination of this floating debt resulted in a corresponding reduction of bank credits.

The long-time debt to the United States was funded in 1923. This arrangement reinforced the financial prestige of Great Britain and made possible the spreading of the debt of approximately $4,500,000,000 over a long period of years. In order to keep the capital of British investors at home, an embargo was placed on the export of capital, and the bank rate of discount was deliberately kept at a rate 1 per cent above the level prevailing in New York.

A substantial accumulation of gold reserves was attempted, not only by the maintenance of a high rate of interest, but also by the deliberate withholding of gold from circulation in England.

The financial authorities in London were firmly convinced that the return to the gold standard would be made, and acting upon this expectation throughout 1924 and the early part of 1925, they proceeded to bid the price of sterling exchange up until it was within about 1½ per cent of mint par. Although this was pure speculation, it had the helpful result of bringing the actual market rate of exchange close to mint par, so that when the final announcement of the return to the gold standard was made, very little readjustment in market rates of exchange was necessary. However, the price level of Great Britain was not so promptly

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issue could be effected by the early part of 1928. Reprints of these reports in form conveniently accessible to American readers will be found in the *Federal Reserve Bulletin*, vol. IV, Dec. 1918, pp. 1190–1192, and vol. XI, June 1925, pp. 375–378. The amalgamation bill was passed in 1928, and provided for a fiduciary issue of £260,000,000.

brought back to an equality with that of the United States. There was probably about a 10-per-cent differential between the wholesale price levels of the two countries when the gold standard was resumed. This discrepancy had serious consequences for industry, as will be explained later in the present chapter.

The Restoration of the Gold Standard.—The return to the gold standard was announced on April 28, 1925, and the Gold Standard Act became effective on May 13. It was provided that the Bank of England should purchase or sell gold bullion at the rate of £3 17*s.* 10½*d.* per ounce troy of standard gold. The Bank was not required to redeem notes in gold coin, but was required to redeem them by furnishing gold bullion in the form of bars of not less than 400 ounces. This provision wiped out any premium on gold, made the paper currency equal in value to gold, and yet enabled the banks to keep gold coin out of circulation and so to conserve their stock of gold reserves.

A very important part of the process of return to the gold standard was the arbitrary control of gold movements, exchange rates and other international developments. The embargo on gold exports which had been enforced since the War would expire in December, 1925. It was provided that this embargo should not be renewed, and that between May and December of 1925, the Bank of England should be granted a general license to export gold freely. This practice restored the free international market in gold bullion. In order to insure, however, that gold would not be exported to excess, the Bank of England arranged to maintain its rate of discount about 1 per cent higher than the New York rate.

In order to safeguard the rate of exchange against undue fluctuations and against the manipulations of speculators, a plan of coöperation was worked out with the United States. The British government established credits of $100,000,000 with J. P. Morgan and Company, and the Bank of England established credits of $200,000,000 with the Federal Reserve Bank of New York. The announcement was made that these credits would be used to the limit in order to protect the stability of the exchange rates against the attacks of speculators. Coöperation between the Federal Reserve authorities and the financial authorities of Great Britain was carefully worked out, and insured the success of the transition to the gold standard.

There are some very interesting parallels between the return to the gold standard after the World War and after the Napoleonic Wars. After the World War, seven years elapsed before the gold standard was effectively restored, whereas after the Napoleonic Wars, only six years elapsed. In the United States, after the Civil War, thirteen years elapsed before the return was accomplished.

The Bullion Committee of 1810 recommended a gradual return to the gold standard and urged that at least two years' advance announcement be made that the return was anticipated. However, when the return was first attempted in 1819, there was practically no advance notice of the date of the return. Of course, business generally anticipated it, but there was no definite knowledge of the exact date. Much the same policy was pursued in England's return to the gold standard in 1925. These two instances stand in contrast with the policy of the United States after the Civil War. In January of 1875, definite announcement was made that the gold standard would be restored in January of 1879.

The financial problem in both post-War periods was carefully studied by expert committees. The famous Bullion Committee of 1810 and subsequent secret committees of both Lords and Commons took expert testimony and made numerous recommendations. The opinions of the economist, David Ricardo, were especially illuminating in these investigations. After the World War, the reports of the Cunliffe Committee in 1918 and in 1919, and the report of the Committee on Currency and Bank of England Note Issues in February, 1925, were of special importance.

Before the return to the gold standard, there were in both periods sharp declines of prices. From 1814 to 1820, wholesale prices fell about 37 per cent; from 1920 to 1925, they fell about 44 per cent. After the return to gold, there was further deflation necessary in order to equalize prices with the levels in gold-using countries. Ricardo predicted that prices would contract 5 to 6 per cent after the final return to gold, but he thought that this decline need not have serious consequences. The Committee on Currency and Bank of England Note Issue in 1925 forewarned: "We must be prepared to face a fall in the final price level here of a significant, though not very large amount, unless it should happen that a corresponding rise takes place in America." In both cases, the fall of prices proved to be more severe than these advance estimates.

Some Effects of the Return to Gold.—The main reasons for wishing to return to gold appear to have been that British financiers desired to regain their prestige as the banking center of the world; and that British merchants desired to eliminate trade risk by securing stability of exchange rates.

These two objectives were promptly realized. London's reputation as the banking headquarters for world trade was restored and wide fluctuations of exchange rates were eliminated. At the beginning of 1924, the exchange rate had been approximately $4.25, but by April, 1925, just before the announcement of return to gold, it had reached $4.79. After the passage of the Gold Standard Act in May, 1925, the rate rose to $4.85, and its fluctuations have since been controlled by the gold points. Stabilization of exchange rates was accomplished by making London again an unrestricted international gold market, and allowing gold to move between countries whenever exchange rates reached the specie points.

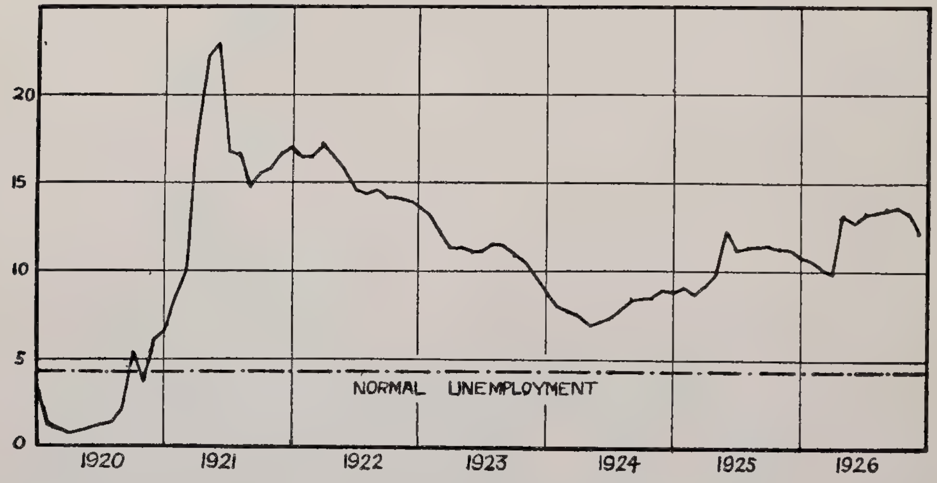
Although the appreciation of exchange in 1924 and early 1925 was indispensable if England was to return to the pre-War mint par, nevertheless this appreciation was not without harmful consequences during the transition period. The rise of exchange had the effect of increasing the cost to foreigners of goods bought in Great Britain and of decreasing the cost to Great Britain of goods bought from foreigners. The rise of exchange, by increasing the cost of sterling and decreasing the cost of dollars, automatically made British exports dear and British imports cheap. This relationship stimulated imports and discouraged exports. In other words, the rise of exchange stimulated an adverse balance of trade. Exports for the twelve months ending March, 1926, were £56,741,000 less than for the like period of the year previous.

In order to cope with the situation, it was necessary that British exporters reduce their export prices enough to compensate for the rise of exchange rates. And as export prices fell, it was necessary that domestic prices also be brought into line. The general price level of England and the United States had to reach a parity. This might conceivably happen either as a result of a rise in United States prices or of a fall in British prices. The latter alternative proved to be the actual outcome. The British index of wholesale prices in April, 1925, was 163; whereas in March, 1926, it stood at 144, 1913 being taken as 100. The price deflation worked severe hardship on British industry. The inequalities of deflation between industries, the difficulty of wage cuts to correspond with price cuts, the discrepancies between export prices and domestic prices or between retail prices and wholesale prices, made a very painful transition period.

During this period, the Bank of England rate of discount played an important rôle. The adverse balance of trade threatened to cause a heavy export of gold. In order to avert this loss of gold, the rate was placed at 5 per cent, and the plan was adopted of keeping the London rate about 1 per cent above the New York rate. Although the high rate was needed to protect the gold reserve, it had in another direction a depressing effect. It served to discourage business and to intensify unemployment. Later in 1925, the rate was lowered to 4 per cent as a concession to business. However, the need for protecting gold reserves soon became so apparent that the rate was raised again to 5 per cent.

CHART NO 25

PERCENTAGE OF UNION MEMBERS UNEMPLOYED



Unemployment and labor unrest were serious problems during the transition period. The accompanying chart shows the prolonged abnormal unemployment. This was a source of distress to labor and of loss to the community. Unrest and dissatisfaction of labor were due not merely to the fact that so many people were out of work, but also to the fact that many employers attempted to enforce wage cuts. These wage cuts culminated in the great coal strike of 1926. Coal, being an important export industry, naturally was one of the first industries to feel the effects of the rise of exchange rates and the general price deflation. Export coal prices had to be cut, and the operators sought to recoup themselves by cutting wages. But labor found that retail prices and the cost of living in general had not fallen by an amount corresponding to the proposed wage cuts. In the face of this discrepancy between retail prices and wages, labor refused to accept the reduction in income.

Significance of the Return to Gold.—Great Britain's action in returning to gold marked a turning point in financial reconstruction. For many years, critics had been advocating that England never return to the gold standard, but that she adopt some form of managed paper currency. A managed currency, so it was claimed, could maintain a stable value by the use of price index numbers, and could be controlled by regulating the volume of currency and credit, fixing the rate of discount, and coöperating with foreign banks, particularly with the Federal Reserve Banks in the United States. Great Britain's action definitely turned the tide away from such innovations.[1] In 1925, Australia, Canada, Egypt, Chile, Finland, South Africa, New Zealand, Holland, Switzerland and the Dutch East Indies all announced plans to return to the gold standard in some form.

The experience of Great Britain has been set forth in some detail, not only because of the nation's prestige as a banking center, but also because of the extent to which Great Britain's problems and policies were fairly representative of those of other countries. Differences there were in degree or in local setting, but fundamentally the experience of all European countries encountered the same economic principles. Hence, the conduct of Great Britain has a very broad significance in the analysis of world-wide financial reconstruction after the War.

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[1] During 1923 and 1924, Austria, Hungary, Germany and Sweden had linked their monetary units with gold.

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Chapter XVIII

PRICE FLUCTUATIONS AND THE BUSINESS CYCLE

Short-Term Price Movements.—When prices were rising during the eighteen-year period from 1896 to 1914, the long-term trend was interspersed with recurrent short-term fluctuations. These fluctuations coincided rather closely with the alternating periods of prosperity and depression in the business cycle. However, at the end of each successive period of depression, prices were somewhat higher than at the end of the preceding period of depression. Thus, by a series of short-term fluctuations, prices gradually were lifted to higher and higher levels. The short-term fluctuations were concurrent with the long-time trend—were, indeed, the medium in and through which the long-time trend worked itself out. For a quarter of a century before 1896, the converse of this process was true; that is, short-term fluctuations repeatedly occurred, but at the end of each fluctuation the price level was somewhat lower than at the end of the preceding one. Hence, gradually a long-time decline of prices was accomplished in and through the shorter waves. It is scarcely necessary to emphasize what is so apparent from these illustrations of price history, that long-time trend and short-time trend of prices are not two separate and discontinuous processes but are simply two phases of one and the same process.

The short-term phase of the process has been frequently designated as a cyclical fluctuation. The term cyclical in this connection is valid if it is rightly understood. It does not imply any fixed periodicity of movement. It does not imply that prices must rise for so many months and then fall for so many months. It does mean that prices have been observed to go through recurrent up and down movements, and that from crest to crest or bottom to bottom of these waves the time interval varies from two or three years to seven or eight years, but most frequently has been approximately three to four years. Moreover, it means that these price oscillations have an intimate connection with those fluctuations of the industrial and financial world which, by common usage, have come to be referred to generally as the business cycle. Indeed, most authorities on the business cycle assign an important, if not the leading, rôle in the business cycle to the fluctuations of prices. For instance, Wesley C. Mitchell takes "profits as the leading clue to business cycles" and stresses the theory that "the margins between different prices within the system hold out that prospect of money profit which is the motive power that drives our business world." [1] J. H. Williams, after a review of the literature of business cycles, concludes, "In the opinion of writers on the subject, price movements constitute an important, and in the minds of many the chief, characteristic of the business cycle." [2] R. G. Hawtrey says: "Whatever other characteristics the trade cycle may have, it is, above all, a periodical fluctuation in productive activity and in the price level." [3]

The Position of Prices in the Business Cycle.—One of the most useful methods of describing the position of prices in the business cycle is to state their relation to production and trade. Warren M. Persons and W. L. Crum have carried a comparison of prices and trade back to 1875 by using bank debits or bank clearings outside New York City as an index of trade and wholesale commodity averages as an index of prices. With certain exceptions,[4] a similarity of movement between trade and prices holds throughout the period. The familiar B curve, or business index, of the Harvard University Committee on Economic Re-

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[1] *Business Cycles, the Problem and Its Setting*, 1927, pp. 107, 116.

[2] *Review of Economic Statistics*, 1919, p. 206. See also PERSONS, W. M., *idem.*, p. 129.

[3] "Monetary Theory of the Trade Cycle," *Quarterly Journal of Economics*, vol. XL, May, 1927, p. 472.

[4] Exceptions may be noted as follows:

Period	Interval	Price Change	Trade Change
July 1885–July 1886	12 mo.	− 5%	+ 13%
Oct. 1888–Apr. 1890	16 mo.	− 5%	+ 10%
Apr. 1891–May 1892	13 mo.	− 13%	+ 9%
Apr. 1900–June 1901	15 mo.	− 5%	+ 15%
Feb. 1904–May 1905	19 mo.	− 2%	+ 8%
Feb. 1925–July 1927	27 mo.	− 11%	+ 7%

search is a composite of these two similar series.[1] It is unnecessary to review here the many statistical verifications in recent years of the doctrine that usually rising prices and industrial expansion occur at about the same time and that the peaks of production and prices are usually not far apart.[2] It is necessary, however, to emphasize that the exceptions are sufficiently important so that we are not warranted in saying, as Pigou does, that "industrial expansions are invariably characterized by rising prices and industrial depressions by falling prices."[3] This statement would be unobjectionable if "usually" were substituted for "invariably." If we do not take the notion too rigidly, it is of great value to think of the price cycle and the business cycle as broadly concurrent economic processes.

However, price indexes differ materially in the nature of their cyclical fluctuation. Such an index as the wholesale average of the Bureau of Labor Statistics derives its mild cyclical movement from a minority of the component commodities which show a wide amplitude of cyclical change.[4] Likewise, Bradstreet's wholesale index of 96 commodities "really registers, not the fluctuations of 96, but of only a few commodities."[1] Persons segregated ten commodities which are "varied in nature, important in industry, unusually sensitive in price, not greatly affected by the seasons, and similar with respect to their main cyclical price movements."[2] The results are stated as follows: "The movements of other indices of commodity prices, such as those of the Bureau and Bradstreet's, during periods of business prosperity and depression, are mainly the result of the fluctuations of the ten commodities which we have selected, and of others closely associated with

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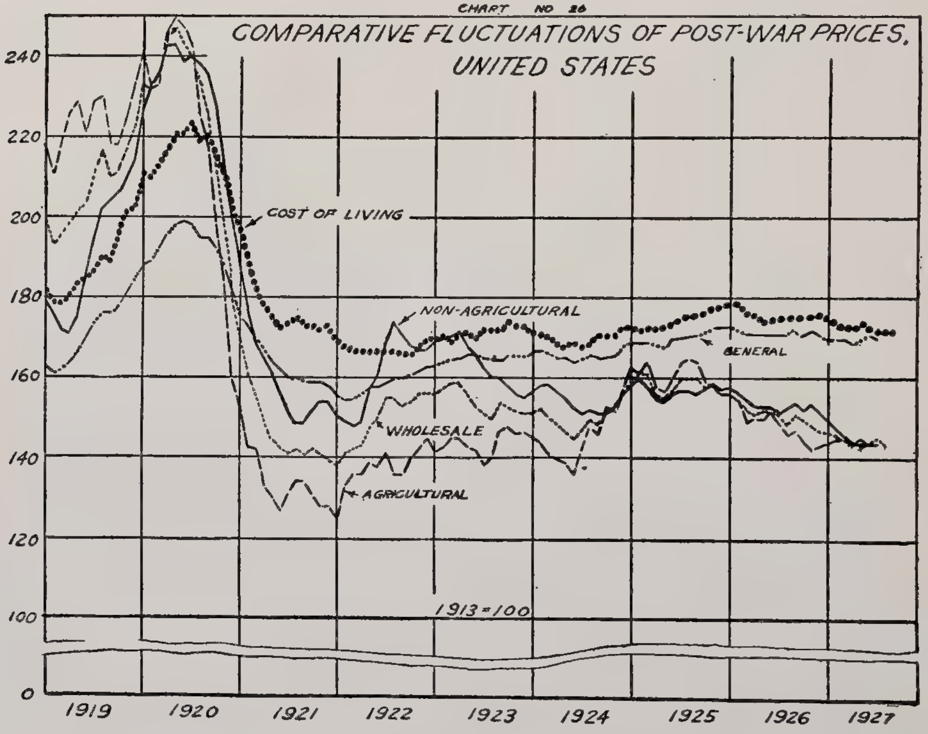
[1] For price and production studies by the Harvard University Committee on Economic Research, see *Review of Economic Statistics*, 1919, pp. 1–110, 206–208; 1920, pp. 380–398; 1921, pp. 353–369; 1923, pp. 187–195; 1924, pp. 16–23; 1925, pp. 217–225, especially p. 221; 1926, pp. 66–67; 1927, pp. 20–29.

[2] Mention should be made of CARL SNYDER'S *Business Cycles and Business Measurements*, 1926, ch. XI, and of IRVING FISHER'S "Our Unstable Dollar and the So-Called Business Cycle," *Journal of the American Statistical Association*, June, 1925, vol. XX, pp. 179–202. Fisher compares the rate or rapidity of change in wholesale prices and the physical volume of trade from 1915 to 1923, and concludes: "Changes in the price level afford an almost complete explanation of fluctuations in the volume of trade for the above period." This view that rapidity of price change causes production change is open to criticism. See, for instance, MITCHELL, W. C., *Business Cycles*, 1927, pp. 266–269, 286–87; HARDY, C. O. and COX, G. V., *Forecasting Business Conditions*, 1927, pp. 308–314. The latter study shows that from 1903 to 1924, turning-points in volume of trade were, in 14 out of 17 cases accompanied by turning-points in the Bureau of Labor Statistics wholesale index within three months before or after the trade change.

[3] Pigou offers an interesting comparison of unemployment and wholesale prices in England from 1871 to 1914. He concludes, "There is no main movement in one curve unaccompanied by a movement in the same sense in the other." *Industrial Fluctuations*, 1926, p. 118, and chart, p. 121.

[4] Twelve commodities out of the whole group, "chosen because of their early movement and tendency to conform to the general movement of the volume of trade" have been used by Snyder as a basis for a special purpose price index. Snyder finds, "The general congruence of the new index of prices and our index of trade is striking." *Business Cycles and Business Measurements, 1926*, pp. 201, 306.



General: Snyder's weighted average of ten groups.
Cost of Living: Department of Labor Index for 32 cities, monthly figures interpolated from data published by Massachusetts Commission on the Necessaries of Life.
Wholesale: Bureau of Labor Statistics, 404 commodities.
Agricultural: Compiled from Bureau of Labor Statistics Index of Wholesale Prices.
Non-agricultural: Compiled from Bureau of Labor Statistics Index of Wholesale Prices.

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[1] Persons, W. M., *Review of Economic Statistics*, 1921, p. 368.

[2] *Ibid.*, p. 353. The commodities were cottonseed oil, coke, pig zinc, pig iron, bar iron, mess pork, hides, print cloths, sheetings and worsted yarns.

those ten."[1] Much caution is, therefore, necessary in the use of broad averages of wholesale prices as a measure of cyclical variation. It is particularly to be noted that the agricultural commodities contained in the general averages commonly reflect the influence of weather and climate more than the influence of the business cycle. For precise and accurate work, clear lines of distinction should be made between the cyclical and noncyclical ingredients of the more general price averages.

The inequalities of short-term changes of various groups of prices are suggested by the chart on page 384. The most stable of all series is Snyder's composite index, based upon ten groups of prices, including the following:

COMPONENTS OF THE GENERAL PRICE LEVEL

Industrial prices	Weight	10
Farm prices at the farm	"	10
Retail food	"	10
Rents	"	5
Miscellaneous cost of living	"	10
Transportation cost	"	5
Realty value	"	10
Securities	"	10
Equipment and machinery	"	10
Hardware prices	"	3
Automobile prices	"	2
Wages	"	15
Total		100

The cost-of-living index shows a moderate fluctuation not widely different from that of the composite index. Wholesale prices show a somewhat wider amplitude of movement. In pre-War years, wholesale prices usually rose not more than 10 per cent from trough to peak of the cycle, but in extreme booms occasionally rose 15 to 20 per cent. In the post-War period, eliminating the exceptional 1919-1921 disturbance, they rose about 15 per cent from the trough of 1922 to the peak of 1923, and about 10 per cent from the trough of 1924 to the peak of 1925. In both of these post-War advances, divergent movements of agricultural and nonagricultural prices are apparent. The amplitude of fluctuation of the index of ten sensitive commodities both before and after the War has usually been from 3 to 4 times as great as that of all wholesale commodities (see chart following,

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[1] *Ibid.*, p. 356.

p. 387). The violent fluctuations of this special group stand in sharp contrast to the very mild fluctuations of a composite index or a cost-of-living index.

These differences in degree of cyclical variation make it imperative that we carefully discriminate between types of price indexes. It is not enough to refer loosely to the cyclical waves of prices. We must designate which kind of prices is meant. Only by refining the concept of the price cycle in this manner can we make it an accurate and reliable instrument for the analysis of monetary phenomena.

Thus far, the price cycle has been discussed from the standpoint of an individual country. However, in actual experience, no country is isolated from the world economy, and as soon as we examine the price movements of many countries we discover a marked similarity in their short-term price movements. The chart on page 214, already referred to as indicating the close correspondence of long-time price trends in England and the United States, may also be referred to as indicating, except for fiat money periods, the close correspondence of short-time oscillations.[1] According to the studies of business annals of seventeen countries by Mitchell and Thorp, there is "a tendency of business cycles in different countries to synchronize their phases."[2] The chart on page 387 of special indexes sensitive to business cycles in England, Germany and the United States shows this tendency during the pre-War period from 1901 to 1914.

Although the general similarity of international price movements is obvious, the degree of similarity varies according to the type of index number used or the type of country considered. The highest degree of similarity is found in indexes confined to commodities which have well-organized international markets. Such commodities as cotton, wheat, coffee, or steel have a nearly uniform price in all countries because their market is world-wide. Price indexes of basic commodities have great international sensitivity because such commodities have highly organized international markets.[1] Price indexes of export commodities or of import commodities are significant because of their responsiveness to international conditions.[2] To the extent that internationally traded commodities enter into the general indexes of wholesale prices, they will dominate the course of such indexes. However, the internationally traded commodities are by no means the whole story in our indexes of general wholesale prices.[3] There are

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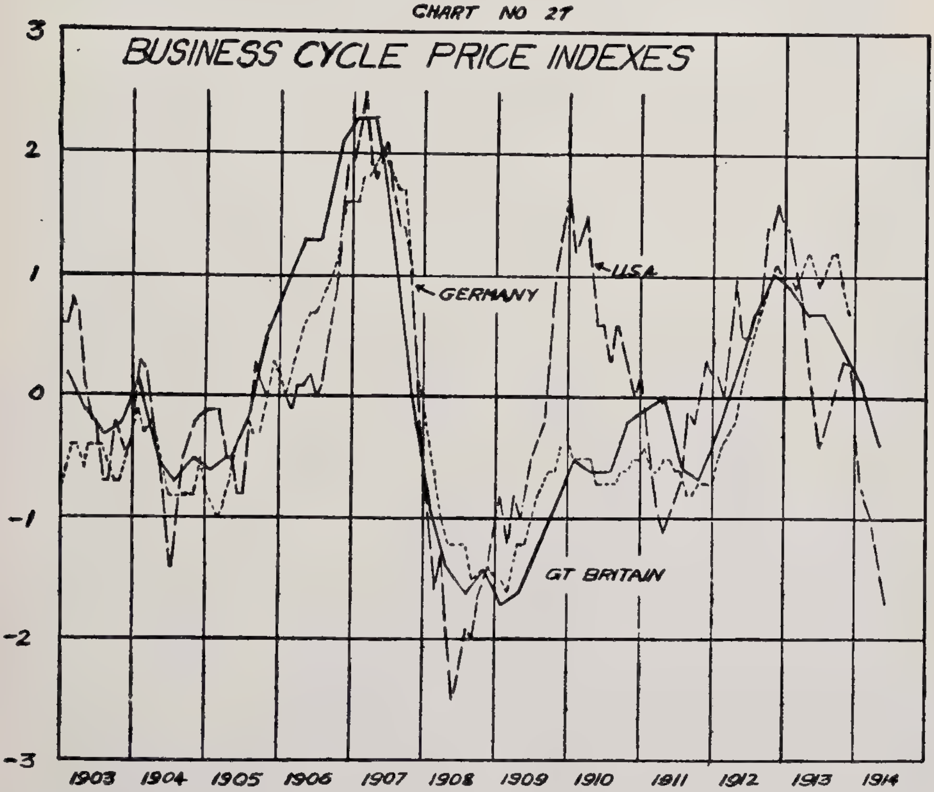
[1] For comparisons between Germany, England and the United States, see Pigou, A. C., *Industrial Fluctuations*, 1926, p. 14 and chart, p. 15; also, Layton, W. T., *Introduction to the Study of Prices*, 1920, pp. 150–151.

[2] Mitchell, W. C., *Business Cycles*, 1927, p. 448; see also pp. 424–445; Thorp, W. L., *Business Annals*, 1926. Also see Mitchell, *Business Cycles*, 1913, pp. 120–129.

CHART NO 27



DATA EXPRESSED IN TERMS OF STANDARD DEVIATION FROM ESTIMATED TREND

U. S. A.—Bradstreet's Indexes of Prices, *Review of Economic Statistics,* 1919, vol. I, 190.
Germany—Ten Commodity Price Index, *Review of Economic Statistics,* 1925, vol. VII, 282.
Great Britain—"All Materials" Price Index, *Review of Economic Statistics,* June, 1922, vol. IV, *Supplement.*

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[1] The Federal Reserve Bank of New York compiles indexes of twenty basic commodities for both England and the United States. These indexes show a striking similarity of movement.

[2] The Federal Reserve Board published such indexes for a number of years, but discontinued them in 1926, chiefly because of unsatisfactory weighting of the indexes.

[3] For comparison of the price indexes discussed in this paragraph see the chart on p. 422.

many commodities whose market is almost entirely domestic. The common term in England for this type of commodity is "sheltered industry." There has been inadequate statistical separation of such prices, but the evidence available seems to indicate that prices of sheltered commodities are not as quickly and promptly sensitive to international movements as those of non-sheltered commodities. Nevertheless, in the course of time, international adjustment does take place in prices of sheltered commodities. Such adjustment occurs in part because the internationally traded articles are often the raw materials required in the manufacture of sheltered articles, and a rise in the price of the international raw material advances the costs of manufacture and induces the sheltered manufacturer to try to advance the price of the finished product accordingly. Also, the internationally traded articles may generate a cycle of confidence, forward buying, and rising demand which is general and all-inclusive in scope and so carries the sheltered articles along on its momentum. Moreover, the internationally traded articles influence the specie flow between countries, the reserves of banks, and the supply of commercial funds; and these changes in the quantity of money and credit have a reflex influence upon the spending power of the community at large and upon the prices of all types of goods. Hence, even though sheltered commodities are less directly connected in their international oscillations, nevertheless they do show significant international similarity.[1]

The degree of international similarity also varies with respect to the severity of the cycle. In the great financial crises, such as those of 1893, 1907 or 1920, the world-wide price movement is remarkably uniform, whereas in some of the milder recessions it is scarcely perceptible. Moreover, the degree of similarity varies with respect to the stage of industrialization attained by a given country. Countries dominated by agriculture often show price aberrations quite out of line with the general world trend. The international price cycle is apparently an outgrowth of the international expansion of the industrial revolution and the money economy.

All of these observations point to the importance of the international connections of prices. In study of the price oscillations of the United States, we should be cautious against placing too much emphasis upon purely domestic explanations, such as changes in the efficiency of American labor, in the excess plant capacity of the American manufacturer, in the purchasing power of the American farmer or in the tax burden of the American taxpayer. There is a certain insularity and provincialism in most of these popular explanations of American prices. We must add to the consideration the international factors in price changes, the repercussion of price fluctuations from country to country, the interconnections of the price cycle among the leading industrial countries of the world.

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[1] See *Depreciated Exchange and International Trade*, United States Tariff Commission, 1922; also *Bulletin 284*, United States Bureau of Labor Statistics, by W. C. Mitchell, pp. 30–31. Also see Chapter XX of the present volume.

A final feature of the cyclical fluctuation of prices to be considered is the changing relative length of inflationary and deflationary phases of the cycle. During a secular rise of wholesale prices, the inflationary phases of the cycle are prolonged, the deflationary phases shortened. During a secular decline of wholesale prices, the inflationary phases are shortened, the deflationary phases prolonged.[1] Although the reasons for this difference are not altogether clear, yet certain inferences may be set up. When gold is abundant and is supporting a long-time rise in prices, the cumulative force of prosperity is not checked, so far as bank credit is concerned, by an early exhaustion of gold reserves. Expansion of credit can go on for a considerable time because the new gold coming from the mines permits expansion of reserves at a nearly equal rate. Obviously if the annual rate of output of new gold is 4 per cent of the existing stock, bank reserves and bank credit have much greater elasticity of expansion than when it is only 1 or 2 per cent. When finally a crisis does occur and depression ensues, the inpouring of new gold rapidly floods the market with money, lowers the bank rate, and stimulates an early revival of business. Conversely, when gold production is deficient and the long-time price trend is downward, a period of expansion will be quickly halted by exhaustion of reserves, and a period of depression will be prolonged by slowness of accumulation of new money. Hence there is a secular trend in the relative duration of cyclical inflation and deflation, depending upon the secular trend of prices.

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[1] For interesting data bearing upon this hypothesis, see MITCHELL, W. C., *Business Cycles*, 1927, pp. 119, 219, 230, 411, 421.

By way of summary of this section, the following generalizations may be noted: (1) Prices undergo a fluctuation which is cyclical in type and which is intimately related to the business cycle; (2) The degree of cyclical fluctuation varies widely depending upon the type of price index employed, but is least in a composite index or a cost-of-living index, greatest in special indexes covering a few sensitive commodities, and medium in the general indexes of wholesale commodities; (3) The cyclical fluctuation of prices shows marked international uniformity, but the degree of uniformity is least in indexes of sheltered commodities and in indexes of agricultural countries and greatest in indexes of internationally traded commodities and in indexes of highly industrial countries; (4) The length of the inflation phase of the price cycle is relatively great during periods of secular incline of prices but relatively small during periods of secular decline of prices; conversely, the length of the deflation phase is relatively small during secular incline of prices but relatively great during secular decline.

Velocity of Circulation of Money and Bank Deposits in the Business Cycle.—By way of further explanation of the position of prices in the business cycle, it is important to state their relation to the velocity of circulation of money and bank deposits. Velocity of circulation of demand deposits lends itself to statistical measurement much better than does that of currency; hence chief consideration will here be given to the former factor. Velocity of demand deposits may be estimated by finding the ratio of the amount of checks drawn during a given period to the average of demand deposits on hand. The amount of checks drawn may be obtained from bank reports giving debits to individual account. To obtain the velocity of circulation for any given month, it is necessary to divide bank debits to individual account for that month by average demand deposits. Suppose such a division gives a result of 4. This means that each dollar of deposits was checked out and redeposited about four times during the month. At this rate, in twelve months each dollar would be checked out and redeposited about forty-eight times. If, then, we were to say that the velocity of circulation in January, 1927 was forty-eight, we should mean that if the rate of turnover for January were to continue for twelve months, it would result in

$48 of bank debits per dollar of demand deposits. Thus we might with fair approximation set up the formula:

$$\begin{array}{c}\text{Velocity of}\\ \text{bank deposits for}\\ \text{January, 1927}\end{array} = \frac{\text{Jan. debits} \div \text{no working days in Jan.} \times \text{no working days in yr.}}{\text{Average demand deposits for January, 1927}}$$

This kind of formula expresses the velocity in the standard form of an annual rate, but permits an estimate of month-to-month changes in the annual rate. Such monthly estimates, when adjusted for secular trend and seasonal fluctuation, yield monthly indexes of the cyclical fluctuation of velocity of bank deposits.[1]

Snyder and Burgess have been able to compute such cyclical indexes for New York City and for 140 outside cities since 1919. For the period prior to 1919, data are less satisfactory, but monthly estimates have been, with fairly approximate accuracy, carried back to 1875. These indexes of velocity of circulation when compared with a cyclical index of trade show "a remarkable degree of congruence, both with regard to the time movement, and the amplitude of the fluctuations."[2] If one surveys the two curves, velocity and trade, over a period of years, one discovers that this congruence, although fundamentally significant and valid, nevertheless is subject to some important qualifications. Sometimes the velocity curve leads the trade curve a few months, sometimes it lags a few months. Sometimes the trade curve ascends 10 to 15 per cent above computed trend, whereas the velocity curve ascends less than 5 per cent. In other words, if one is looking for an exact sequence or proportionality of change, one will not find it. But a fundamental similarity of major movements one will find, and this relationship is highly significant.

In order to indicate the importance of this relationship, we may state it in the terms of the familiar equation,[1] $MV = PT$, or $M = P \times \frac{T}{V}$. If T and V agree in their cyclical movement in time and amplitude, then the ratio between T and V will be a constant. If $\frac{T}{V}$ is a constant, then M varies in the business cycle directly with P; *i.e.*, $M = P$. This leads to the inference that the inflationary phase of the business cycle is made possible by the temporary increase of M at a rate more rapid than the secular trend of M; and that the deflationary phase is made possible by the temporary failure of M to keep up with the secular trend. Thus, the cyclical fluctuations of P are accounted for by the deviations of M from its line of trend. This being true, it follows that whenever the banks expand their deposits at a rate in excess of secular trend, they are making inflation possible; and whenever they restrict their deposits to a rate below secular trend, they are furnishing the basis for deflation.

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[1] This explanation is intended to outline the principles underlying the calculation of velocity rather than to state the actual detailed process of calculation. For a full explanation of the detailed process see SNYDER, CARL, *Business Cycles and Business Measurements*, 1926, ch. VII; also *Journal of the American Statistical Association*, June 1923, and March 1924; *Review of Economic Statistics*, October 1924; *Harvard Business Review*, October, 1924; and *Journal of the American Bankers' Association*, February, 1924. For earlier and pioneer attempts to measure velocity of circulation, see KEMMERER, E. W., *Money and Credit Instruments in their Relation to General Prices*, 1907, pp. 108–119, and FISHER, IRVING, *The Purchasing Power of Money*, 1911, pp. 441–477.

[2] SNYDER, *op. cit.*, p. 151; charts, pp. 146, 152–153.

According to this view, the fluctuating needs of trade are automatically met by the quickened circulation of money and credit, without the necessity for any cyclical increase in quantity of money and credit. If, for instance, trade in the business cycle rises 5 per cent and velocity of bank deposits rises 5 per cent, the needs of trade are promptly met. The same amount of money, circulating 5 per cent more rapidly, does 5 per cent more work. If, in addition to the increase of velocity, bank deposits are also increased 5 per cent, the needs of trade are doubly met, once through the quickened velocity and a second time through the enlarged deposits. By meeting the demand for money twice, the cyclical rise of prices is made possible. In terms of the price equation, if V and T both rise 5 per cent, M remaining constant, the needs of trade are amply met and a rise of P is restricted. On the other hand, if V and T both rise 5 per cent, and M also rises 5 per cent, the needs of trade are met twice over, and a rise of P will be facilitated.

Of course, the strict mathematical equation must not be too rigidly construed. The psychology of the business cycle cannot be put in a rigid mold. Some resiliency in credit is not amiss any more than is some change in prices and in business. Absolute stability of any of these factors is not proposed by anyone. On the other hand, relative stability is perfectly consistent with the requirements of a dynamic business economy. Immoderate inflation and deflation can be checkmated by a timely restriction or expansion of the quantity of money and credit. This principle is of utmost importance as a guide to the policy of individual banks and to the policy of central banks. It explains the basis for both the moderate and the excessive fluctuations of prices in the business cycle, and holds an important place in the dynamic theory of the value of money.[1]

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[1] No satisfactory means of measuring month-to-month fluctuations in velocity of currency and coin have been worked out, but there are good *a priori* grounds for inferring that such fluctuations are not unlike those of demand deposits. Hence, for the sake of simplicity, instead of writing the equation in the form $MV + M'V' = PT$, we may use M and V in the broadest sense to include both money and deposits, and so abbreviate the equation to the form $MV = PT$.

It will be useful to supplement this discussion of velocity of circulation from the viewpoint of American quantitative economists with a discussion of certain concepts of velocity from the

[1] In general support of these views, see MITCHELL, W. C., *Business Cycles*, 1927, pp. 122–128; CASSEL, GUSTAV, *Theory of Social Economy*, 1924, pp. 458–467; SNYDER, CARL, *American Economic Review*, vol. XIV, December, 1924, pp. 699–713; FISHER, IRVING, *Purchasing Power of Money*, 1911, pp. 441–477.

In the above analysis, the point of view has been the monetary experience of the United States. It is quite possible that not all points of this analysis are equally applicable to other countries. The case of England may be cited. Referring to the theory of "a specially intimate connection between the physical volume of production and the velocity of circulation of bank deposits," D. H. Robertson finds "no corroborative evidence from English conditions." *Banking Policy and the Price Level*, 1926, p. 90 n. Likewise, A. C. Pigou finds, "The facts, as displayed in two charts, do not suggest that any corresponding proposition holds good of the United Kingdom." *Industrial Fluctuations*, 1927, pp. xi, 147–154. Although Pigou's statistical data are not sufficient to give a decisive test to the proposition, nevertheless his conclusion is the most plausible one to account for price fluctuations in England. In essence, the theory of Robertson and of Pigou is not that velocity of circulation differs in direction or timing from trade fluctuations, but that *it differs in amplitude* from trade fluctuations. They contend that, at least in England, the changes in velocity of circulation are more violent in amplitude than the changes in the trade cycle. It is this *excessive amplitude* of the velocity cycle which largely determines the price cycle in England. Similar views are entertained by J. M. KEYNES, *Monetary Reform*, 1924, pp. 90–91, 95; and R. G. HAWTREY, *Currency and Credit*, 1923, pp. 46–49, 377, 425–426. A corollary of these views would be that the amplitude of the cycle of volume of bank credit is quite small,—in fact, much less than that of the price cycle or the trade cycle. That this corollary is probably warranted may be seen by observing the chart presented on page 364 above. It is specially noteworthy that bank deposits showed an almost negligible decrease in the deflation of 1920–1922, whereas wholesale prices showed a decrease of more than 50 per cent. This difference in degree of bank deposits decline and price decline is in part accounted for by a fall in velocity of circulation quite out of proportion to the fall in physical volume of trade or volume of employment.

viewpoint of various British economists. If the reader will recall the material in Chapter IX, he will have in mind such concepts as unspent margin, consumers' outlay, traders' outlay, real balances, and proportion of real income held in the form of a stock of ready purchasing power. The value of such concepts arises from the fact that they throw light upon the economic motives which lead to a change in velocity of circulation. No man deliberately and consciously resolves to increase the velocity of his dollars in bank or in pocket when trade is expanding, or to decrease it when trade is contracting. It is no part of his conscious intent that a change in velocity occurs. He is not even aware that such a change is occurring. As Hawtrey has remarked, "The rapidity of circulation of money or credit is not a phenomenon which enters directly into anyone's experience."[1] On the other hand, "His balance is a matter of practical moment to him; he has to devote some care and thought to regulating it; consequently we can tell what circumstances and what motives are likely to affect it and how; whereas if any circumstances affect the rapidity of circulation of money it can only be indirectly, by affecting balances."[2]

During a period of trade revival, traders expect prices to rise and sales to expand. Acting upon this expectation, they make heavier commitments than usual and draw more checks than usual on their accounts at the banks. As their balances at the banks dwindle, they are spending money more rapidly, and this process constitutes an increase in velocity of circulation. Their motive is to prepare for rising prices and sales by stocking up with goods; their method is to draw down their balances at the banks; their result is to increase the ratio of volume of payments to average deposits, *i.e.,* to increase the velocity of circulation. If at the same time they increase their borrowings from the banks, and so increase their deposits, they are multiplying their money-spending power. This is true because they not only have more dollars but also are spending each dollar more rapidly. The pressure of such rapid outlay of funds in the commodity markets gives rise to a strong demand for merchandise and a cyclical advance of prices. This explanation is in accord with ordinary experience. It is a familiar fact to bankers that their depositors not only ask for greater accommodation in good times than in bad, but also that they utilize their balances more intensively, draw checks more rapidly, pay out money more frequently as well as take it in more frequently, and in all these ways enhance the velocity of circulation of money and credit.[1]

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[1] *Currency and Credit,* 1923, p. 48.

[2] *Ibid.,* pp. 48–49.

The term, velocity of circulation, as used in the foregoing discussion, is to be distinguished from the term, income velocity, or circuit velocity, of money. The former deals with the number of times the money of a country changes hands in a given period in order to carry on the trade, or money-work, of the country. The latter deals with the number of times money passes from consumers' hands out through the business economy and returns to their hands during a given period. It represents the frequency with which money flows through the circuit from consumers to producers and back again. "It measures the number of times during which a representative unit of money appears as *income* during a year; that is to say, it is equal to the aggregate money income accruing to the community in a year divided by the aggregate stock of money."[1] Certain estimates have placed this ratio at 2, *i.e.*, money completes the circuit from consumption out to production and back to consumption about twice each year.[2] This estimate is very rough and approximate. By way of comparison, it should be pointed out that velocity of circulation as used in the equation $MV = PT$ is such that all the money changes hands about thirty times each year. Or, to put the same relations in somewhat different form, all the money reaches the public as income about once every six months, whereas all the money changes hands in the process of carrying on trade about once every two weeks. Assuming that such estimates are fair approximations to fact, we find that the velocity of circulation per period of income circulation ($30 \div 2$) is about 15. In other words, for every time that money flows into the hands of the public as income, it must have changed hands in the give and take of trade about fifteen times.

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[1] The process here described is the inflationary phase of the business cycle but the converse process, or deflationary, phase is similar, except that the direction of movement is reversed. Moreover, although the process described applies to traders' balances and traders' outlay, substantially the same process also applies to consumers' balances and consumers' outlay. During good times, consumers spend rapidly and tend to keep a small proportion of their real income in the form of idle money at the banks or in pocket. During bad times, they spend slowly and cautiously, and tend to accumulate a high proportion of their real income in the form of idle money at the banks or in pocket. In this connection, the statement of KEYNES, *Monetary Reform*, 1923, pp. 90–91, 95, is clarifying: "The characteristic of the 'credit cycle' consists in a tendency of k and k′ [the fraction of their income which people desire to keep in the form of ready purchasing power in bank and in pocket] to diminish during the boom and increase during the depression, irrespective of changes in n and r [Refer to page 194 n above, for definition of the terms of Keynes' equation $n = p\ (k + rk')$], these movements representing respectively a diminution and an increase of 'real' balances; so that we might call this phenomenon deflation and inflation of real balances. Cyclical fluctuations are characterized, not primarily by changes in n or r, but by changes in k and k′." This concept is useful in that it places emphasis upon the psychological or dynamic aspect of the situation; that is, it places emphasis upon the plans, expectations and decisions which people make at successive stages of the business cycle, upon their pecuniary strategy in the cycle. It relates prices as well as velocities of circulation to the whole range of policies and attitudes which people display in their attempt to adjust their fortunes to the vicissitudes of the business cycle. However the concept is not without its faults and limitations, and chief among these is the fact that it is a composite of so many things that it does not yield to statistical measurement and prediction. After a given price change has occurred, it is easy to look backward and to impute the change to inflation or deflation of real balances. But in order to look forward and to forecast the trend of prices, we should need to know current monthly real income and monthly real balances as affected both by additional borrowing and by additional spending. Lacking such data, we cannot ascertain what fraction of their income people consider it desirable to keep in the form of ready purchasing power. Hence the Keynes-Hawtrey approach, although useful as a general concept, does not furnish the exact quantitative information so desirable when our problem is price control or price forecasting.

Obviously, other factors remaining the same, if income velocity becomes more than 2, let us say 3, and velocity of circulation per year remains the same, the money of the country will change hands ten times instead of fifteen, during each income period, that is, four months, and the total money will become income every four months instead of every six months. If the annual real production of the country were to remain unchanged, there would be no more goods than before to be bought, but there would be more money income with which to buy them, because consumers would now be realizing as large a flow of income every four months as they formerly did every six months. If now they receive 25 billion dollars as income every four months, whereas formerly they received 25 billion dollars as income every six months, clearly their total spending power per annum is now 75 billions against only 50 billions formerly. With this increase in money-spending power, people would bid for goods and so drive the price level up. Thus an increase in income velocity, other things remaining the same, would cause an increase in prices, and a shortening in the period of circulation of money from one appearance as income to another would cause an increase in prices. Hence, other things remaining the same, the price level will move directly with the income velocity of money and inversely with the length of the period of circulation of money from one use as income to another.

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[1] Pigou, A. C., *Industrial Fluctuations*, 1926, p. 152.

[2] Robertson, D. H., *Banking Policy and the Price Level*, 1926, p. 58 n.

This conclusion, like the old quantity theory, rests upon the static condition, *other things remaining the same.* But, as in the case of the quantity theory, so in the case of this theory, it may be objected that other things do not remain the same and therefore it is not a guide to dynamic price behavior. That is to say, velocity of circulation will not remain the same, quantity of money will not remain the same, and physical volume of goods will not remain the same. Presumably an increase in income velocity will occur in the business cycle at about the same time and for about the same reasons as the increase of prices, velocity of circulation, quantity of money and volume of production. Consequently, a change in income velocity is only one of a complex group of variables involved in a given change in prices. Each will act upon the others and the resultant will be inflation. Unfortunately this whole approach to the problem of income velocity has not been subjected to adequate statistical verification and we must, therefore, consider it as a tentative though highly suggestive hypothesis.[1]

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[1] For analysis of various phases of this approach, the reader should consult Pigou, A. C., *op. cit.*, part I, ch. XIV–XV; part II ch. IV; Robertson, D. H., *Banking Policy and the Price Level*, 1926, pp. 45–47, 57–59, 71–103; Keynes, J. M., *Monetary Reform*, 1923, ch. III; Schumpeter, J., *Archiv für Sozialwissenschaften*, 1917–1918, pp. 650–700; von Wieser, F., *Schriften des Vereins für Sozialpolitik*, 1910, vol. CXXXII, pp. 514–530; Foster W. T., and Catchings, W., *Money*, 1924, chs. XVIII-XX, and *Profits*, 1925, part V. The theory of Foster and Catchings is concerned chiefly with the general nature of the business-cycle rather than with the price phase of the cycle. However, it offers an interesting variant of the income velocity concept. It holds that as prosperity advances, "Consumer buying does not keep pace with production. There is not an even flow of money from producer to consumer and from consumer back to producer." (*Profits*, p. 409). Since money does not complete the circuit from one consumption use to another quickly enough to take the goods off the market as fast as they are produced, the goods accumulate and there is overproduction relative to the money purchasing power available in the hands of consumers. In other words, the income velocity of money slows down during advanced prosperity, the period of monetary circulation lengthens, and sales cannot be made fast enough to keep pace with production. At this stage, goods must be liquidated

By way of an attempt to put in brief form the present status of our knowledge of velocity of money as it relates to the price cycle, the following tentative propositions may be stated:

First, the velocity of circulation of currency and of demand deposits undergoes a cyclical fluctuation in the United States which in timing and amplitude corresponds closely with the major fluctuations of the business cycle.

Second, the velocity of circulation in England seems to agree in timing, but not in amplitude with the fluctuations in the business cycle. This observation suggests that the cyclical character of velocity of circulation may differ considerably from country to country.

Third, to the extent that a given amount of money and credit meets the cyclical needs of trade by an elastic velocity of circulation, additions to that amount at a rate more rapid than normal trend of growth are inflationary, and at a rate less rapid, deflationary.

Fourth, the theory that price fluctuations are related to cyclical changes in the income velocity of money is suggestive and significant, and invites more thorough quantitative investigation than has yet been given.

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at falling prices. Economists will await with interest attempts at statistical verification of this hypothesis. A discussion of the same general thesis, though differing in certain respects from the Foster and Catchings version, will be found in HASTINGS, H. B., *Costs and Profits*, 1923, and "The Circuit Velocity of Money," *American Economic Review*, vol. XIII, 1923, pp. 230–244. Also reference should be made to the synopsis of the views of various authorities on the business cycle who have stressed the "lack of equilibrium in the process of disbursing and spending incomes and of producing values," as presented by MITCHELL, W. C., *Business Cycles*, 1927, pp. 35–42, 51.

Chapter XIX

PRICE FLUCTUATIONS AND THE BUSINESS CYCLE (Continued)

Bank Deposits, Prices and the Business Cycle.—In the United States, probably more than 90 per cent of all transactions are settled by the use of checks and deposit accounts at the bank. In England also a very high relative importance is given to these substitutes for currency. Many other countries have not attained the same degree of reliance upon payment by check, but evolution in that direction has been appreciable in recent years. This trend of usage has made necessary a direct comparison of the supply of such substitutes for money with the fluctuations of prices.

A problem in method arises when it comes to deciding upon a statistical series which will accurately measure this supply factor. Since data are more ample in the United States than elsewhere, attention may be given chiefly to the banking records of this country. Member banks in leading cities now make weekly reports to the Federal Reserve Banks covering their main resources and liabilities, and all other member banks make similar reports monthly. Prior to the Federal Reserve system, National banks made reports to the Comptroller of the Currency four to five times each year. These reports have been continued under the Federal Reserve system and are the chief sources of continuous long-time data on the supply of bank funds.

One series of data contained in such reports is loans and discounts. Statistical studies of this series show that the volume of loans and discounts undergoes a cyclical fluctuation, with turning points occurring within three months before or after the turning points of the wholesale price cycle.[1] For more precise comparison, loans and discounts of New York City banks should be omitted, since these are unduly influenced by the speculative use of funds in the New York stock markets. When loans and discounts of outside banks are compared directly with wholesale prices, the similarity of cyclical fluctuation is very marked.[2]

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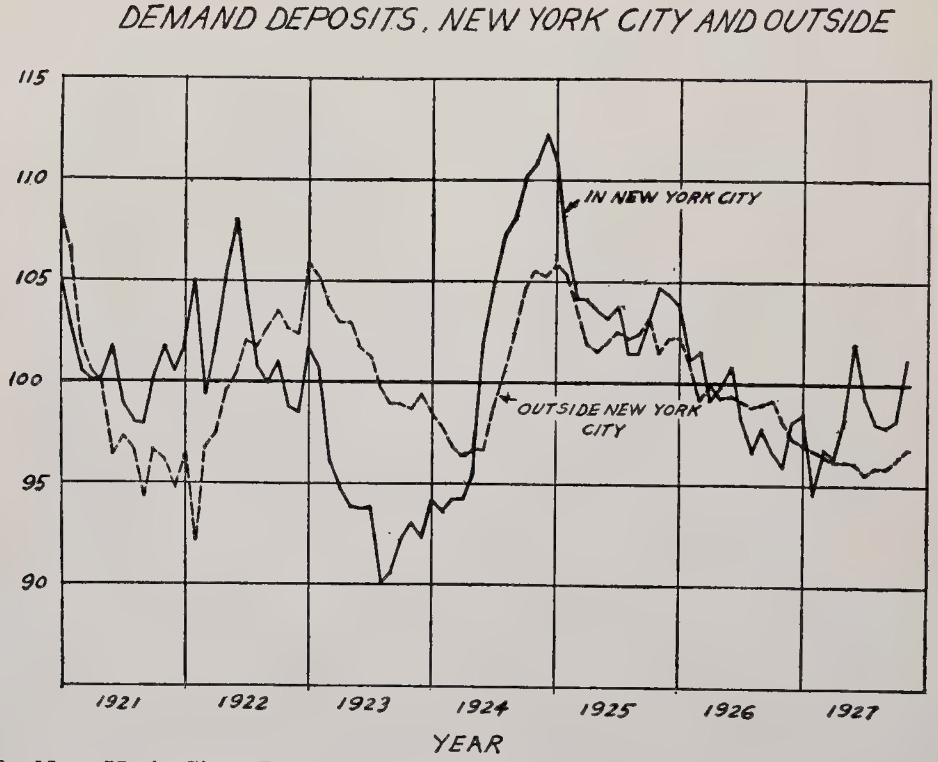
[1] See, for instance, Hall, L. W., *Cyclical Fluctuations Occurring in the National Bank System During the Years 1903 to 1921*, p. 43.

[2] See, for instance, Warren M. Persons' comparison for 1903–1914 of outside

However, loans and discounts are not a true measure of the supply of bank funds since the size of the checking account is not the amount of credit borrowed but the amount on deposit. Although there is a certain general correspondence between loans and deposits, the deposits series has sufficient individuality so that it should be studied separately. Demand deposits are better than time deposits as a measure of the supply of bank funds, since the latter are subject to a very limited amount of check-drawing by depositors. Moreover, for the purpose of comparing credit supply with commodity prices, demand deposits in New York City should be separated from those outside, in order that the element of speculation may in so far as possible be eliminated. The chart on

CHART NO 28



In New York City: Demand Deposits of Reporting Member Banks in New York City expressed as a percentage of straight-line trend of growth.
Outside New York City: Demand Deposits of Reporting Member Banks outside New York City expressed as a percentage of straight-line trend of growth.

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loans with a business curve (Curve B) based largely upon wholesale prices. *Review of Economic Statistics*, 1921, p. 32. Compare KUZNETS, S. S., *Cyclical Fluctuations, Retail and Wholesale Trade in the United States*, 1926, pp. 52–53.

page 400 compares the cyclical fluctuations of demand deposits of New York City and of outside banks. Although the period covered is brief, it illustrates the tendency for New York City demand deposits to precede outside deposits at the major turning points, and emphasizes the importance of differentiating between the two classes of deposits.

The chart on page 406 makes a direct comparison of outside demand deposits with wholesale prices. The close congruence of the two curves is striking. There is no clear tendency for either curve to lag behind the other, but there is evidence of a tendency for the two curves to rise and fall at about the same time. Neither curve invariably leads or lags. It would be unwarranted to conclude from this showing that the quantity of money precedes the price level, because the opposite sequence is evident at certain periods, and an almost simultaneous movement is evident at certain periods.

Of course this interval is too brief to permit sweeping generalization. It is important to survey a broader field of price history before reaching definite conclusions. In making any such survey, one should bear in mind that the issue here raised is the very heart of much of the controversy of the past generation of economists over the so-called quantity theory. Certain authorities have endeavored to prove that M′ precedes P and is the fundamental cause of P. At first the battles fought around this proposition did not clearly separate cyclical fluctuations of prices from secular trend; but of late the separation has been attempted by numerous students of the subject. Reference is made in a footnote to some of the investigations along such lines.[1] The writer has undertaken the task of appraising the methods and findings of these investigators. The positive hypothesis to which one is led is that neither prices nor deposits consistently lead or lag in the business cycle. This positive proposition, the writer realizes, runs counter to the claims made by various investigators whose findings have been hailed as verification of the quantity theory. Nevertheless, when subjected to critical examination, none of these quantitative tests of the quantity theory is, in the judgment of the present writer, proof of such a proposition as that M or M′ tends to precede and to cause changes in P.[1] The most frequent flaws of method in such studies have been an arbitrary selection of turning points and lags, an uncritical reading of causation theories into correlation coefficients, an acceptance of assumptions as to secular trend which are objectionable, and a credulous reliance upon the adequacy of indexes of M′ and P to measure the things they presume to measure. There is not space in the present treatment to show the detailed application of these objections, and, for all but the technical student, such a discussion would be wearisome. The outcome of the writer's critical appraisal will therefore be stated directly and positively. P sometimes rises a few months in advance of M′ and sometimes a few months after M′. Also, P sometimes falls a few months in advance of M′ and sometimes a few months after M′. The major turning points of M′ and P are usually separated by intervals not exceeding three to six months, and the major fluctuations of either series are closely preceded or followed by the major fluctuations of the other series. There is a very definite tendency for the cyclical rise and fall of prices and demand deposits to synchronize approximately and fundamentally, but for the lead or lag to undergo marked changes from period to period.

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[1] Hansen, A. H., *Cycles of Prosperity and Depression, 1902–1908*, pp. 38–39; Working, Holbrook, *Quarterly Journal of Economics*, 1923, pp. 228–256, and *Review of Economic Statistics*, 1926, pp. 120–133; Pigou, A. C., *Industrial Fluctuations*, 1926, chart on p. 152; Snyder, Carl, *American Economic Review*, vol. XIV, 1924, pp. 707–713; Hall, Lincoln W., *Cyclical Fluctuations Occurring in the National Bank System During the Years 1903 to 1921*, pp. 44, 85–90; Young, Allyn A., "An Analysis of Bank Statistics for the United States," *Review of Economic Statistics*, Oct. 1924, Jan. 1925, and July 1927; Cassel, Gustav, *Theory of Social Economy*, 1924, pp. 458–467, 572–579, 600–601; Fisher, Irving, *The Purchasing Power of Money*, 1911, pp. 265–275.

Up to this point the discussion has centered around the relation of demand deposits to wholesale prices. From certain standpoints these measures of M′ and P are too narrow. The studies of Carl Snyder and others have shown that wholesale prices often diverge seriously from more general averages of prices. During extremely dynamic periods, such as the years centering about the World War, this divergence may become extreme.[2] Hence, even

[1] It is equally important to note that none of the quantitative investigations constitute proof of the anti-quantity theory, if by that theory is understood the frequently stated proposition that P rises first and causes subsequent increases in M and M′ in order to carry on business at the new price level. The net result of the quantitative investigations referred to is, in the opinion of the writer, to suggest that the quantity theory comes under the head of that class of hypotheses which have to be restated before they are susceptible of verification or disproof by quantitative research.

[2] See Snyder, Carl *Business Cycles and Business Measurements*, 1926, ch. XI. Also see chart in present volume, p. 384.

under ordinary conditions, wholesale prices are not always an accurate indicator of the trend of the general price level, and under extraordinary conditions they may give a grossly distorted picture of the general level. Snyder finds that "the general price level shows little relationship to the cyclical movement in business."[1] Such fluctuations as do occur in a general price index seem to be related to a more general measure of bank credit than is afforded by demand deposits. Total loans and investments of member banks (or combined demand and time deposits) would furnish a general index of bank credit. Such a credit index shows a significant correspondence with the general price index. The amplitude of cyclical deviation from trend of growth is relatively small in both these measures of M' and P, but the timing of the movements is substantially the same for the two series.[2]

If the worker in this field requires an index of the general purchasing power of money, he should either adopt a broad composite index of all kinds of prices or make certain that for the period in question wholesale prices move in unison with such an index. In any event, he must ever be on guard against uncritical acceptance of wholesale prices as a measure of general purchasing power. The admonition to be impressed upon those who work with price statistics is, "Know your price index." They must know whether the index in question is a true measure of the fact it purports to measure, and whether the fact it purports to measure is, after all, the right fact to afford a solution of the problem in hand.

This emphasis on discrimination in the use of price indexes does not, however, imply that wholesale price indexes are unimportant. For many purposes they are the indexes of primary importance. Particularly for the purpose of following the sensitive interconnections of trade boom and price inflation as well as of trade slump and price deflation, wholesale indexes are more useful than more general indexes. On the other hand, for the purpose of a guide to central bank policy in stabilizing the purchasing power of money, wholesale prices alone are too inaccurate, and some more general or composite index must be drawn into the reckoning. Obviously, it is necessary not only to define clearly one's purpose in using a price index but also to know the right price index for the given purpose.

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[1] SNYDER, *op. cit.*, p. 201.

[2] By finding a "computed" price level from the formula $P = \frac{MV}{T}$, Snyder has been able to develop a curve which shows an interesting relation to the actual price level. See *American Economic Review*, 1924, pp. 710–713. Also see attempt by Holbrook Working to prepare a "computed" price level, *Review of Economic Statistics*, 1926, pp. 130–133.

In the present chapter, the purpose is to analyze the relation of prices to the business cycle. For this purpose, a general price index has limited value because its cyclical waves are slight. However, wholesale price indexes are of large value, because of their sensitivity to the business cycle.

After the worker in this field is clear as to purpose and index number, he still faces the task of determining what measure of credit should be matched against the selected measure of prices. If he is using a general average of all prices, he will need to compare it with a general measure of credit, such as total loans and investments, or total time and demand deposits. If he is using an index of wholesale prices, he will need to compare it with a measure of demand deposits. In the United States, he will often find it desirable to use demand deposits of banks outside New York City, in order to eliminate as much as possible the influence of speculation in securities.

Interest and Prices in the Business Cycle.—According to Irving Fisher, "The principal force affecting the cycle is the *real* rate of interest, the sum of the *money* rate of interest and the rate of appreciation (positive or negative) of the purchasing power of the dollar." [1] This theory holds that the real rate lags behind the movements of prices and so stimulates borrowing during prosperity and discourages it during recession. The discrepancy between the nominal and real rate is explained as follows: "Let us suppose that prices are rising at the rate of 3 per cent each year. It is plain that the man who lends $100 at the beginning of the year must, in order to get 5 per cent interest in purchasing power, receive back both $103 (then the equivalent of the $100 lent) plus 5 per cent of this, or a total of $108.15. That is, in order to get 5 per cent interest in *actual purchasing power,* he must receive a little more than 8 per cent interest in money." [2] But ordinarily the nominal rate will fail to increase so rapidly, and there will exist an "inadequacy and tardiness of adjustment." [3] This lag of real interest behind prices will be an inducement to enlarged borrowing, which will in turn lead to further bidding up of prices.

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[1] *Journal of the American Statistical Association*, vol. XVIII, p. 1024.

[2] *The Purchasing Power of Money*, 1911, p. 57.

[3] *Ibid.*, p. 58.

> Rise of prices generates rise of prices, and continues to do so as long *as the interest rate lags behind its normal figure*. Evidently the expansion coming from this cycle of causes cannot proceed forever. It must ultimately spend itself. The check upon its continued operation lies in the rate of interest. The rise in interest, though belated, is progressive, and, as soon as it overtakes the rate of rise in prices, the whole situation is changed. As soon as the interest rate becomes adjusted, borrowers can no longer hope to make great profits, and the demand for loans ceases to expand.[1]

There follows a halt in the rise of prices, and in crisis and depression a similar lag of interest behind prices on the down grade fosters the fall of prices. "A fall of prices generates a further fall of prices. The cycle evidently repeats itself as long as the rate of interest lags behind."[2]

Although this theory draws attention to an important phase of the price-interest cycle, it is open to criticism in that it overemphasizes one factor in a complex situation. Statistical studies have seemed to confirm the view that usually the rise of interest rates lags behind the rise of prices and of trade in the business cycle, and that the fall of interest rates lags behind the fall of prices and of trade.[3] The lag has most frequently been from four to twelve months, when rates on short-term commercial paper are compared with wholesale commodity prices and trade. Other classes of interest rates, such as those on call loans, bonds, customer loans, or bank acceptances, exhibit many individual differences in their relations to the business cycle and to prices. The most significant rate for comparison with wholesale prices and trade is that on short-term commercial paper. The lag of this rate behind prices is a familiar fact to students in this field.[4]

When interest rates are low and money is easy, there is a stimulus tō business men to borrow more extensively. Bankers who find funds accumulating on their hands offer such funds at sufficiently low rates to induce producers to borrow. Additional loans place purchasing power in the hands of borrowers and as this becomes a money demand for goods, it pushes prices upward. After a time, banks find that loans have advanced as far as cash and reserves will safely permit, and take steps to restrict loan expansion by raising the interest rate. This action leads to some repayment of debts and contributes to a contraction of credit and a fall of prices. In these respects, the interest rate is an important factor in price fluctuations. However, it is only one of a large group of factors, and at times others in the group overshadow it in importance. The complexity of the business cycle forces us to take into account a wide range of interacting influences; and while interest rates are one of these influences, they are by no means the all-important influence. Their relative significance shifts from one period to another and from one phase of the business cycle to another, and requires analysis with due regard for all the conditioning circumstances which may happen to prevail.

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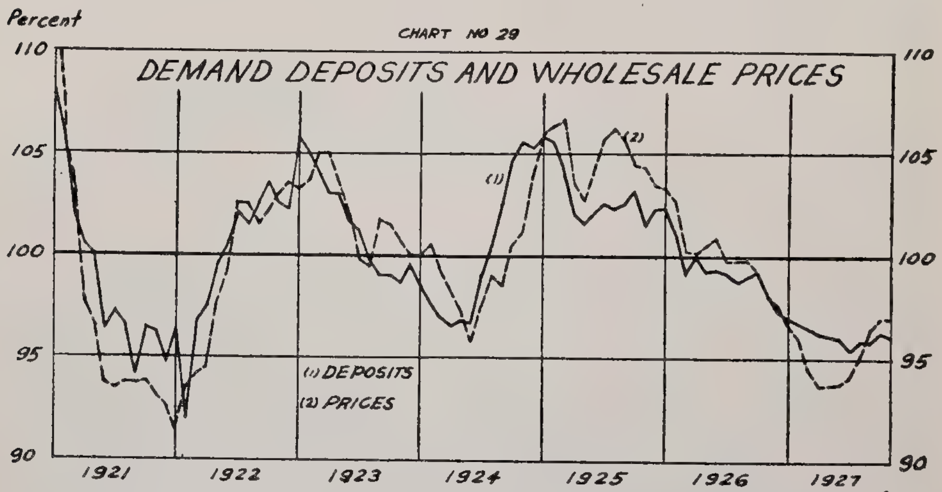
[1] *The Purchasing Power of Money*, 1911, pp. 60, 64.

[2] *Ibid.*, p. 68.

[3] For instance, see MITCHELL, W. C., *Business Cycles*, 1927, p. 219; *Business Cycles*, 1913, pp. 140–170; SNYDER, CARL, *Business Cycles and Business Measurements*, p. 202, and ch. XII; PERSONS, WARREN M., *Review of Economic Statistics*, 1919, 1922, 1923, 1927.

[4] See chart and discussion on p. 482.



Prices: U. S. Bureau of Labor Statistics, Wholesale Price Index On a Base of Average of 1921-1927 as 100
Deposits: Net Demand Deposits of Outside Reporting Member Banks, Expressed as Percentage of Trend of Growth

Theory of Commodity Price Fluctuations.—Having advanced the view that price fluctuations have a pattern of behavior which resembles that of the business cycle, and that trade, velocity of circulation, bank deposits, and interest rates also have short-time fluctuations which are closely interconnected with prices, we may proceed to an explanation of price movements in each phase of the business cycle. We may start with the phase commonly referred to as revival, and in succession deal with prosperity, crisis or recession, and depression.

(1) *Revival and the Upturn of Prices.*—As depression wears on, loans and deposits fall, cash accumulates in the bank and gold flows into the country if depressed prices have resulted in an unfavorable trade balance. The consequent high ratio of cash and gold to deposits leads the banks to offer funds at low interest rates and to lend on liberal terms. Rates on bonds and other securities fall to levels which make capital-raising relatively cheap. Thus, the fundamental monetary factors become favorable to revival.

Meanwhile, industrial and trade conditions assume a favorable form. Stocks of goods become depleted and orders must be placed for new production. At first these orders merely expand physical production at existing prices; but soon the borrowing of funds to finance expansion, the enhancement of payroll, the firming of demand, initiate price advances in the more sensitive industries. Construction industries expand under the stimulus of cheap capital, and their activity adds to payrolls and reinvigorates consumer demand. These factors are *self-generating* in the sense that they automatically develop out of the very nature of depression; but they are often supplemented by other factors which are accidental or fortuitous in character. For example, if the country happens to be blessed with good crops whereas foreign countries suffer from subnormal crops, the rise of agricultural prices and purchasing power acts as a stimulant all along the line. The farm sector of commodity markets then takes the lead in toning up markets of all kinds. If export trade picks up, owing to the fact that for any reason at all certain foreign countries have swung into a period of prosperity, such trade reinforces the optimistic trend in domestic markets. In all these ways a combination of self-generating and accidental factors creates a favorable industrial and trade situation.

Now a psychological factor enters the situation. The scattered initial increases in prices lead to an expectation of further increases and an anxiety to make commitments while prices are yet relatively low. Forward buying displaces hand-to-mouth buying and the new vigor of demand results in higher prices. The prospect of better prices and larger volume leads to an expectation of greater profits, and gradually there spreads over the bulk of the community the spirit of optimism. The briskness of business requires more rapid drawing of checks and so increases velocity of bank deposits. The financing of larger volume of production requires borrowed funds, hence an increase in loans and deposits. This increase often precedes the actual rise of prices, since the initial pick-up frequently consists of orders placed at existing prices; and the filling of these orders forces producers to borrow from the banks during the production period. In this particular type of pick-up M′ precedes P. In other types, however, prices are bid up at the outset and M′ either lags behind P or changes simultaneously. But whatever the type of revival, each rise of prices brightens the expectation of further rise. The conjuncture of easy money pressing for use, of industrial and trade conditions ready for expansion, and of a growing psychology of confidence and optimism, brings it about that each rise of prices generates further rise and a cumulative advance of M′, V′, T, and P ushers in that phase of the cycle commonly termed prosperity.

(2) *Prosperity and Rising Prices.*—When prosperity is in full swing, the rise of loans and deposits pours into the hands of the public new money purchasing power which is used in competitive bidding up of prices; and each rise of prices leads borrowers to feel the need for more loans and deposits in order to do business at the new price level. Collateral for new loans is ample, due to the enhanced volume of goods and the inflated prices at which they are valued. Commercial banks resort to rediscounting at the central bank in order to obtain funds adequate to meet the demands of their customers. Currency flows out of the vaults of the banks and into circulation in order to meet the needs of enhanced payrolls and retail trade. Often reserves are depleted by gold exports, in order to meet an unfavorable trade balance growing out of heavy import purchases of raw materials at high prices. With cash flowing into circulation, gold often flowing abroad, and deposits expanding, reserve ratios necessarily decline. Interest rates rise, but lag behind the general movement of business and prices.

In the field of industry and trade, employment is good, plants are used to capacity and new construction is undertaken. Physical output expands rapidly in some lines, though slowly, if at all, in others; costs of operation rise, and stocks of goods become larger than usual. These more or less self-generated features of the prosperity cycle are frequently reinforced by accidental features such as good harvests at high prices, or extraordinary prosperity on the part of the country's best foreign customers. The rise of prices becomes very uneven, retail prices advancing more slowly than wholesale prices, prices of consumers' goods more slowly than those of producers' goods, prices of manufactured goods more slowly than prices of raw materials, prices of organic raw materials more slowly than those of mineral raw materials, prices of general commodities more slowly than those of special commodities sensitive to the business cycle, prices of farm products more (or less) slowly than prices of other products depending on crop and weather conditions at home and abroad.

Interspersing both the monetary and industrial activity of prosperity is a dominant psychological tone of optimism. Realized profits are good and expectations of future profits are bright. Consumers make heavy outlays in the enjoyment of good times and traders make heavy outlays in order to stock up with goods before prices ascend to new heights. Commitments, speculations, and orders become very heavy. The quickened pace of these optimistic developments reflects itself in the more rapid velocity of circulation of money and credit, the clamor for increased accommodation from the banks, and the further rise of prices and trade. Hence, the cumulative advance in monetary, industrial, and psychological factors leads to closely interconnected changes in all elements of the price equation, M, V, M′, V′, P and T.

(3) *Crisis or Recession, and the Down-turn of Prices.*—In some cases, the trade boom continues until the reserve ratios of the banks become dangerously low. This condition reflects an external drain of gold by exportation, and an internal drain of cash from the banks into circulation. At this juncture, the banks raise interest rates, ration credits more cautiously, restrict renewals of existing loans, and, in general, contract outstanding credit. Borrowers try to remain solvent by liquidating commodities and other assets. The throwing of commodities on the

market causes prices to slump, and cautious buyers to hold off buying in hope that prices tomorrow will be still lower. "The distinguishing characteristic of a crisis is the pressure to sell, caused by the peril of bankruptcy."[1] In this phase of the business cycle, the limitation on money and credit very definitely is the active dominating feature. Even if all other factors are favorable to continued prosperity, the limits to M and M′ will call a halt to business and price advances. In the ensuing readjustment, prices fall, runs on the banks occur here and there, gold is rushed into the country from abroad, cash is hoarded by the public, business men face emergencies which force them to seek special accommodation from the banks, industry slows down, unemployment becomes serious, profits are lowered, and fear and pessimism seize the imagination of the community.

Crisis is the turning point of an extreme wave of prosperity. But by no means do all periods of prosperity go to such lengths. Many periods of prosperity gradually taper down and gently fade into business recession without the spectacular phenomena of a crisis. These moderate recessions are more commonplace than the violent crises, but they are fully as significant and important. They appear to be due to an accumulation of stresses and strains in the framework of prosperity. Indeed, in a sense, prosperity breeds its own downfall because it generates a series of destructive frictions in the chief elements of business activity. These frictions would bring about a collapse of prosperity and of inflation regardless of the condition of bank reserves.

In part, these stresses and strains are due to the way in which cost prices advance upon selling prices. Labor costs per unit of product advance, partly due to higher wages, partly due to lower efficiency. Prices of raw materials advance more than prices of finished products. Capital costs advance as the rate of interest finally abandons its lagging position and moves progressively upward. Transportation, becoming overburdened with the output of industry, suffers from delays and inefficiencies. Gradually these cost factors make it more and more difficult for various lines of business to operate at a profit.

In part the stresses and strains of prosperity are due to the maladjustments of production, of income distribution, and of consumers' outlay. Unbalanced production rather than general overproduction takes place. Overproduction in some lines is accompanied by underproduction in others. Good or bad harvests, errors of optimism in planning production schedules, lack of statistical data showing current stocks and output, all enter into the production maladjustment. Income distribution is upset by lags of wages, interest, or other shares, by shifts in farm purchasing power due to crop condition and foreign demand, and by large dividend windfalls in the more prosperous lines of business. Corresponding with these shifts in income distribution are shifts in consumer outlay. Some classes of buyers have money to spend; others do not. Some sections of the country and some foreign countries are good outlets for merchandise; others are not. For a time, the purchasers of necessity goods constitute the main market; then for a time the purchasers of luxury goods assume unusual importance. The mutations of consumers' outlay, of income distribution, and of production equilibrium, in addition to the disproportionate advances of cost prices and selling prices in numerous key industries, all conspire to set up stresses and strains in the fabric of prosperity. These cumulative maladjustments gradually lead to a slowing down of trade and of velocity of bank deposits, a general attitude of hesitation and pessimism in the community, a lowering of loans and deposits at the banks, and an uneven but appreciable decline of commodity prices. In this recession phase of the business cycle, changes in T and P assume a leading rôle and M and M′, V and V′ largely adapt themselves to the requirements of business and prices.

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[1] HAWTREY, R. G., *Currency and Credit*, 1923, p. 140.

(4) *Depression and Falling Prices.*—With respect to monetary conditions, depression is usually marked by dull demand for funds and consequent lowering of loans and deposits, by an accumulation of cash in the hands of the banks reflecting the slump in payrolls and retail trade, and often by a growth of surplus gold reserves due to specie imports arising from the favorable trade balance which tends to develop when prices at home are relatively low. Reserve ratios rise, money is easy, and interest rates decline.

With respect to industrial conditions, unemployment spreads, idle plants multiply, production reaches bottom. If harvests are poor and farm prices low, the business depression is aggravated by agricultural depression. If foreign countries also are in a business slump, export markets add dullness to the already stagnant domestic market.

These monetary and industrial conditions are related to a psychological condition. Confidence is undermined, pessimism reigns supreme. Buyers limit themselves to hand-to-mouth commitments in the hope of being able to buy at lower prices in the future. The sluggishness of trade communicates itself to the velocity of bank deposits and the demand for bank loans. Extreme caution dominates the business horizon, money outlay for goods is held to a minimum, and prices fall progressively. Each fall adds to the expectation of further fall and helps to generate further depression. Thus T, P, V and V' continue at low levels and M and M' adjust themselves to the circumstances.

Forecasting Commodity Prices.—Because prices are so intimately associated with the business cycle, many attempts to forecast the changes in prices have been made. A survey of the assumptions underlying such forecasts may well be presented here. Upon examination, the techniques of forecasting prices prove to be inadequate and unsatisfactory. In fact, competent price forecasting is one of the most serious gaps in the whole field of forecasting.

(1) *Forecasting by Use of Lags and Sequences.*—Some authorities claim that a fall in security prices and a sharp rise in interest rates indicate a probable decline in commodity prices within a few months.[1] Others claim that a deviation of bank deposits from their line of secular trend foretells a corresponding fluctuation of prices within about six to twelve months.[2] Others set up the theory that a sharp rise of prices will be followed by a sharp fall, and that no considerable inflation can take place unless there has previously occurred a serious deflation.[3] Finally, it has been common to infer price movement from study of bank reserve ratios. When ratios approach the minimum designated

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[1] For example, see VANDERBLUE, H. B., *Problems in Business Economies*, 1924, pp. 22–23, 34–36, where is explained the use for forecasting purposes of the A, B, and C curves of the Harvard University Committee on Economic Research.

[2] For example, see WORKING, HOLBROOK, "Bank Deposits as a Forecaster of Prices," *Review of Economic Statistics*, 1926, pp. 120–133. Also see chart above, p. 406.

[3] For example, see *Standard Trade and Securities Service*, May 2, 1927. "A substantial rise in the level of general prices would be probable only from a level lower than the current one."

by law or custom as necessary for solvent banking, the community often looks forward to a contraction of credit and a reunion of prices as corrective of inflation. One and all of these theories attempt to forecast prices by establishing a lag of prices behind some barometric series. When the barometer changes, prices are also expected to change according to the established sequence. The major difficulty in such a technique lies in determining in advance whether the barometer itself is registering a major change or merely a temporary irregularity. It is easy to be wise after the event, but hard to identify and appraise a true shift of the barometer early enough to make the forecast reliable. Each of these barometric devices is helpful but none gives a dependable basis for price forecasting. Many outside factors must always be taken into account, many conflicting forces resolved, and much personal judgment interspersed with the mechanical lags.

(2) *Forecasting from Disturbances in Special Groups of Prices.*—Snyder has developed a price index of twelve "early-moving" commodities and Persons an index of ten specially sensitive commodities. Both of these are useful because their turning points commonly antedate those of the more sluggish general indexes of wholesale prices. Many observers follow the course of agricultural as distinct from nonagricultural prices, and infer that a major change in either of these groups will exert pressure in the same direction on the all-commodity indexes. Others separate prices of exported and imported goods from prices of domestic goods and read into the unequal changes of such groups some prophecy as to the trend of the entire mass of commodities. Others compute what proportion of all commodities in a given index are rising, what proportion falling, and what proportion stationary. When the proportion rising becomes unusually great, the prospect for a general advance of prices is considered very good. Others fasten attention on certain individual commodities, and consider the supply and demand factors peculiar to them. Finally, some students have developed indexes of price dispersion, which are intended to have barometric significance.[1] The difficulty with all of these devices is that although they explain what *is* happening or *has* happened, they do not show whether the

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[1] See Crump, Norman, *Manchester Guardian Commercial*, May 19, 1927, p. 583. "A rise in prices is now imminent, as dispersion is now apparently at its lowest, which means that the next change must be in an upward direction."

same thing will continue to happen, either in the special group or the general group of prices.

(3) *Forecasting from Central Bank Policy.*—If the Federal Reserve Banks raise the rate of rediscount sharply and tighten the money market by selling acceptances and securities in the open market, the business world is likely to expect such action to check inflation and to inaugurate a downturn of prices. Conversely, if the Federal Reserve Banks lower the rate and ease the money market by purchasing securities in large volume, the business world is likely to expect an upturn of prices. Thus, central bank control of discount rates and of open-market transactions furnishes a basis for important price expectations. The huge gold stocks and high reserve ratios of the Federal Reserve Banks after 1922 led many European authorities to predict a great era of inflation in the United States. The prediction was not fulfilled, partly because the Federal Reserve Banks restricted the amount of permanent secondary expansion of bank credit which could be built upon the new gold reserve. It is difficult to predict the effect of abnormal gold imports into a country until the restrictive policy of the central bank is clearly known. If the United States were to lose gold rapidly by export, contraction of credit and a fall of prices would probably ensue if the Federal Reserve Banks took no action to offset the loss of gold. But if they did take action by purchasing securities and bills in the open market, a large outflow of gold could take place without deflationary consequences for the United States. Finally, the growth in volume of member bank indebtedness to Federal Reserve Banks is often taken as a sign of overexpansion and of approaching reaction in trade and prices. One difficulty in interpreting central bank policy in any of these respects is the fact that the effectiveness and significance of such policy shift from phase to phase of the business cycle, and from one cycle to another.

(4) *Forecasting from International Developments.*—It has already been shown that both the business cycle and the price cycle have marked international similarity. On the strength of this observation, many authorities find a clue to the price trend in any one country by studying the world-wide trend. This viewpoint is an excellent corrective to many of the purely domestic and provincial explanations of price movements. Not only are actual price movements abroad significant, but also related finan-

cial developments abroad are significant. Coöperation among the leading central banks may admittedly point toward expansion or restriction of credit at the great financial centers of the world. Announcement of return to a gold standard by many countries between 1924 and 1927 implied contraction of currencies, industrial depression, and declining commodity prices. Crisis or depression in foreign countries from any cause communicate their influence in the form of receding prices to the home country; prosperity communicates advancing prices. The international redistribution of gold is often conceived to be an omen of rising prices in the gold-importing country and of falling prices in the gold-exporting country. The realignment of price levels from this cause is, however, subject to a high degree of control by central banks. Hence, changing gold stocks cannot in themselves be heralded as a sign of proportionate price changes. All of these international considerations throw light on the trend of prices but they by no means furnish a definite basis for forecasting. Whether prices in country X will rise to the foreign level or the foreign level will fall to a parity with prices in country X is a perplexing question; and the observer is in reality forced to make a double forecast, *i.e.*, a forecast of foreign prices and a forecast of domestic prices. This attempt throws the observer back upon the other techniques of forecasting which are discussed elsewhere in this section.

(5) *Forecasting from Nonmonetary Factors.*—Many students follow the trend of inventories of merchandise as a clue to prices. They assume that rapid accumulation of stocks of goods indicates eager forward buying and a probable rise of prices; that the existence of abnormally large stocks indicates excess supply and a probable fall of prices; and that heavy liquidation of stocks of goods clears the market and prepares the way for a later price revival.[1] Many students follow the course of production and trade, assuming either that a cyclical wave of general activity is likely to be marked by a like wave of commodity prices, or that overproduction in particular lines can be ascertained as a sign of impending price decline, or that unbalanced and maladjusted production can be related to price readjustment. Some endeavor to compare production with consumption, supposing that under-

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[1] Moody, *Investment Letters*, July 28, 1927: "Serious credit inflation in the absence of overexpansion of inventories appears almost impossible."

consumption can somehow be measured and used as a warning of forthcoming price recession.[1] The presuppositions underlying most of these forecasts is that the trend of prices is governed by the demand and supply of goods and that monetary conditions are not a significant factor in such demand and supply forces.[2] A somewhat similar viewpoint is found among those who claim that excess plant capacity, or keen competition, or increased efficiency tend to force prices downward. Perhaps the main handicap in forecasting from these factors is that they usher in a revival of prices as often as they do a decline of prices. As such, they do not indicate which way the price winds may blow. Finally, many authorities stress the psychological elements in the price outlook. Optimism and confidence lead to large business commitments, increased borrowing, and advancing prices. Each rise of prices may generate the expectation of further rise, and this expectation may so intensify the immediate money-spending activity of business that it sets in motion the very forces which bring about that further rise. Conversely, a fall of prices may generate the belief in a further fall and may so curtail money spending that it helps to bring about that further fall.[3] These waves of optimistic and pessimistic expectations are cumulative until external conditions intervene. Undoubtedly the psychological factor is ever present, but the elusiveness and incommensurability of such a factor limit its serviceability for forecasting purposes. It will be seen, therefore, that a great many nonmonetary factors may be drawn upon as aids in forecasting prices, but that none of them taken separately nor all of them taken together gives more than a very restricted fund of knowledge for the required purpose.

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[1] L. P. AYRES, Cleveland Trust Co., *Monthly Review*, May 15, 1927. "The fact that prices keep on slowly going down means that the supplies of goods tend to be a little greater than the active demand for them, so that sellers are finding themselves constantly compelled to make price concessions and buyers are continually demanding better terms."

[2] BABSON, *Business Supplement*, March 1927. "As long as the rate of output exceeds demand, competition remains keen and price-cutting is used as a popular method for removing merchandise, there is no reason for assuming that the declining tendency of prices is over." GIBSON, THOMAS, *Monthly Forecast*, July, 1927; "I state without hesitation that for many years to come the trend of prices will be to a lower level. With mass production reducing the costs of fabrication and distribution, with transportation facilities greatly improved, with wasteful inventories a thing of the past, and with the greater efficiency of labor and the more scientific employment of credit, that appears inevitable."

[3] See PIGOU, A. C., *Industrial Fluctuations*, 1926, pp. 122, 155.

If the reader will now glance back over the review of the various techniques commonly employed in price forecasting, he will discover that in spite of their great diversity, they fall seriously short of furnishing an adequate, tangible, standard of procedure. Some one of these techniques is usually seized upon by the price economists and the others are relegated to the background. Even the most comprehensive use of all the techniques would, however, still result in price predictions of uncertain value. At best, price forecasting is in a far from satisfactory stage of development and calls for more exact quantitative knowledge than we at present possess.

Some Dominant Impressions of Price Fluctuations.—As one reviews the behavior of all elements of the price equation in the business cycle, one is impressed with their fundamental unity. There is a certain solidarity in the movements of trade, velocity, credit, currency, interest, and prices. The interconnections of these various factors are quick and sensitive. An initial disturbance in any one factor transmits its influence to all other factors, and the changes in these react back upon the original disturbance. No one factor can be singled out as *the cause* of the price cycle. It seems quite beside the point to debate whether M is the cause of P or P the cause of M. Both M and P act and interact upon each other, and in common they act and interact upon the many outside factors of the business cycle. The sequence and the amplitude of changes in the various factors recur in roughly similar form from one business cycle to another. A general pattern of similarity is stamped upon the lag and the degree of fluctuation of each series. Yet in the midst of this uniformity, there are shifts in the interrelations of prices and all other factors from phase to phase of the business cycle. There are shifts in such interrelations from cycle to cycle in the same phase. That is to say, not only do the interrelations differ as between prosperity, crisis, depression and revival, but also they differ as between any two periods of prosperity, any two periods of crisis, etc. Consequently, the fundamental uniformity of the price cycle is penetrated with a complex diversity of fluctuations. These viewpoints contribute to a more adequate understanding of the dynamic position of prices in the business cycle, and to a theory of the value of money which accepts change, transition, and movement as normal, constant, and primary phenomena.

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Chapter XX

INTERNATIONAL CONNECTIONS OF PRICES: GOLD STANDARD

The general price levels of the various countries are interconnected. The similarity of price fluctuations in leading countries is a significant feature of their fundamental economic relations. The similarity of long-time price trends is illustrated by the chart on page 214, presenting the indexes of wholesale prices in England and the United States since the beginning of the nineteenth century. With the exception of periods when specie payments were in abeyance, these indexes coincide to a remarkable degree. The similarity of short-time cyclical fluctuations is illustrated by the chart on page 387. The indexes of cyclical movements in Germany, England, the United States and other advanced industrial countries show an approximately simultaneous rise and fall. This quick responsiveness to a common trend arises in part from the fact that all these cyclical indexes include some of the same commodities. However, even the most comprehensive averages of all commodities at wholesale show a correspondence of movement which, though less rapid and sensitive, nevertheless is definite and real. The degree of international similarity varies with changing conditions, but the fact of basic similarity is clearly demonstrated.

The explanation of this similarity will here be made chiefly from the viewpoint of the United States. *First, the viewpoint will be that of the United States in relation to other countries operating on a gold basis.* The pre-War situation furnishes important background experience for such an approach, but faces the limitation that the Federal Reserve system in the United States and numerous modifications of banking law and policy abroad prevent the pre-War phenomena from being considered in all respects typical and normal of post-War conditions. Yet the strictly modern situation, dating from the return to gold by European countries in 1924-1925 and after, is so brief that one must be cautious in drawing inferences from it. We may take the new banking mechanism as a point of approach, but temper it at all times with the principles which operated in the pre-War era, modified and amended to suit the new conditions of the present era.

Second, the viewpoint will be that of the United States on a gold basis dealing with other countries on a paper basis. This viewpoint obviously represents the actual situation during and immediately after the World War, and similar situations accompanying the Civil War and the Napoleonic Wars.

Price Structure, Internal and International.—In discussing the international similarity of price variations, we need to differentiate between various parts of the price structure. The highest degree of similarity is reached in those commodities which enjoy a well-organized international market. Wheat, cotton, copper, and rubber may be cited as illustrations. The prices of such materials tend to equality in all countries, except for differences due to costs of transportation or to customs duties. Their price movements synchronize closely over international areas. A discrepancy at any point is rather promptly ironed out by the activity of speculators alert to any opportunity to buy low in one area and to sell high in another.

From the standpoint of any individual country, it is useful to classify internationally traded commodities by export or import groups. If the United States exports cotton to England, and a rise in the world price of cotton occurs, this rise represents an export price advance in the United States but an import price advance in England. Obviously indexes of export prices or of import prices may be expected to vary materially from country to country, depending upon the kinds of commodities which are most important in each country's outgoing and incoming traffic.

At the opposite extreme from internationally traded commodities stand commodities which enter almost exclusively into domestic trade. Illustrations of such "sheltered" goods are found in brick, stone, or other commodities whose bulk or weight in proportion to value limit their market to areas within narrow radius of producing centers; in articles of dress or of food for which local custom provides a demand; or in articles of specialty manufacture which cater to domestic idiosyncracies. Prices of such domestically traded commodities often differ considerably from country to country. Fluctuations of domestic prices are at times sharply nonuniform and dissimilar over international areas. However, even domestic prices usually show some real degree of sensitivity to international movements, although the ultimate and slow interconnections of prices of home-traded goods are in contrast with the prompt interconnections of prices of internationally traded goods.

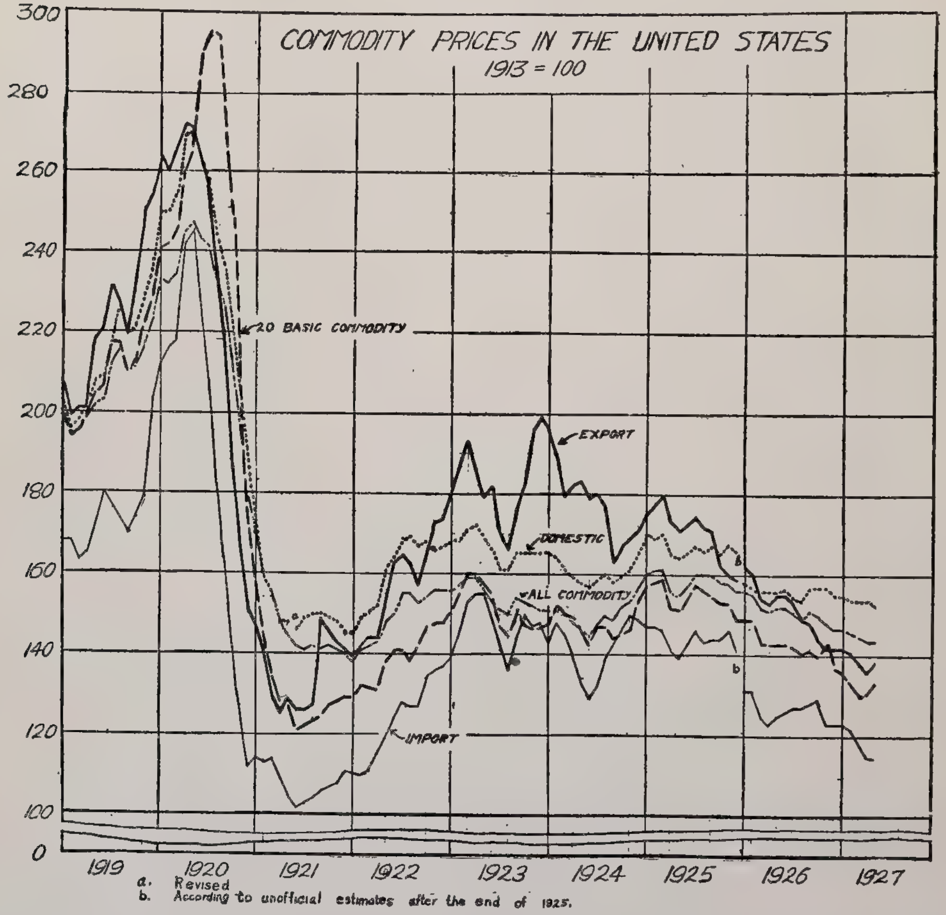
In between these two extremes stand a third group of commodities which enjoy an international market of limited scope and organization. Aluminum ware, pottery, special textile fabrics, or structural steel furnish illustrations. Although there is some foreign demand for these products of the United States, it is not sufficiently large to dominate the market or to effect swift international adjustments of prices. These intermediate commodities are more similar in their international movements than domestic commodities but less similar than commodities having highly organized world markets.

The accompanying chart suggests the divergence which may take place in the fluctuations of certain price groups. Much of the period covered by the chart is abnormal because of post-War readjustments. However, the abnormal factors merely magnify a situation which is always present in some significant degree. Early in 1925, when a number of countries, including England, returned to a gold basis, export prices started downward, to be followed some months later by import prices, and eventually and to a lesser degree by domestic prices.

International comparisons are often made on the basis of general averages of wholesale prices. These composite indexes are slowly and moderately sensitive to international trends. Such sensitivity as they possess is largely due to the fact that they are heavily loaded with commodities which enter freely into international trade. Practically all general indexes of wholesale prices contain a relatively small proportion of quotations of highly specialized manufactured products whose consumption is found chiefly in the home market. Indexes of the cost of living are more likely to reflect the domestic elements in the price structure. Although the latter indexes are slow and uncertain in adjusting themselves to any uniform international trend, nevertheless they usually do show common direction of movement where major fluctuations are concerned.

Thus far, prices of commodities have been the subject of consideration. For many purposes, however, it is desirable to direct attention to noncommodity prices. The prices of securities and of real estate may show wide discrepancies between countries; likewise, wages and rents may follow widely scattered trends. In the noncommodity price field the tendency to international equalization can scarcely be said to exist. Local factors decisively predominate in many of the price fluctuations of this character.

CHART NO. 30



a. Revised
b. According to unofficial estimates after the end of 1925.

Domestic, export, and import prices as computed by the Federal Reserve Board until the end of 1925, thereafter according to unofficial estimates. All commodities at wholesale expressed in the index of the Bureau of Labor Statistics. Twenty basic commodities expressed in the index computed by the Federal Reserve Bank of New York.

The Mechanism of International Payments.—The interconnections of prices between countries are made effective through the mechanism of international payments. The scope of this mechanism extends not only to the money markets but also to the exchange markets and to the channels of trade. By far the larger part of imports visible and invisible are paid for by the process of cancellation against exports visible and invisible. The money value of the total imports tends to approximate the money value of the total exports. This process of clearance requires a mechanism of credit instruments, trade documents and exchange markets. The use of letters of credit, bills of exchange, trade and bankers' acceptances, and other instruments is necessary as a means of exchanging all the imports against all the exports. Detailed discussion of these instruments will be omitted from this treatment because it is assumed that the reader has some familiarity with the elements of foreign exchange.

In the exchange markets is found the mechanism for the quotation of prices on bills of exchange. By comparison of actual prices with mint pars of exchange it is possible to ascertain the relative pressure of demand and supply for the means of payment between countries. The points where gold is likely to be shipped between countries are indicated by the deviations of actual rates from mint pars by margins equal to the cost of shipping the specie between countries. Dealers and speculators in exchange watch for opportunities to make forward purchases or to sell short, and thereby they tend to steady the day-to-day fluctuations of rates.

The central banks and the joint-stock banks are parts of this international mechanism. Net balances are transmitted by bankers' bills and cablegrams. Bankers' balances are transferred from one country to another through correspondent institutions. Short-term loans are shifted from one country to another by the banks. Likewise, ownership of securities is shifted from one country to another. In the event that these devices are inadequate to adjust net differences between debits and credits, gold has to be shipped. The specie flow, however, will ordinarily be a last resort. The operation of this mechanism is subject to a certain degree of regulation by central banks. The central banks may conserve their gold reserves by raising discount rates or tightening money through open-market operations.

The international mechanism of payments is a complex and intricate arrangement, but under ordinary conditions it effects international adjustments in a prompt and sensitive manner. Through this mechanism an initial disturbance in the form of a rise in prices in one country will transmit its influence to the price levels of other countries, and these changes will in turn react back upon the initial disturbance. Moreover, an initial disturbance in the form of a shift in the balance of trade, a change of interest rates, an increase in foreign investment, a radical departure from old bank legislation, or an unusual inflow or outflow of gold will affect the price level of a country, and through the various features of the international mechanism of payments will ultimately affect world-wide price movements.

Some Initial Disturbances Which Are Conducive to a Relative Rise of Prices.—A rise in prices in one country relative to world prices may receive its impetus in a variety of ways. The following discussion of initial disturbances, while making no pretense to include all types of cases, endeavors to state briefly some of the common situations in which relative price advances originate.

1. *Gold.*—We may consider first the influence of a net import of gold. The gold is received by member and nonmember banks. In order to utilize the gold to maximum advantage, the banks will usually treat the gold as a reserve in order that they may expand loans, discounts and investments by an amount several times as great as the new gold in reserve. Member banks will thus place the new gold on deposit with the Federal Reserve Banks where it will count as legal reserve and permit a credit expansion perhaps in a ratio of $10 of new credit to $1 of new gold reserve.[1] As a matter of experience, we know that member banks tend to push out new credit into use as rapidly as new acquisitions of gold reserves permit. They cannot afford to hoard the gold as an idle asset in their own vaults. They are alert to make the largest possible legitimate profit, and to this end they promptly lodge the new specie with the Federal Reserve Banks and proceed to expand their earning assets to the maximum possible under the reserve requirements.

The process of expanding credit usually entails some lowering of interest rates. Since most international banking carried on in the United States centers in New York City, the rates will fall first at that locality. The call loan rate will be quick to reflect the down turn, and short-term commercial paper and bill rates will promptly follow a like course. Customer rates will be slow to register the trend, and net yields on bonds and mortgages will be even more insensitive. The focus will be on call rates and short-term commercial paper and bill rates. Not only will rate adjustments take place, but also banks will more freely extend accommodation to their customers at given rates of interest. Instead of strictly rationing their loans among anxious borrowers, they will be pushing out loans in search of new business. Some of the new funds will go directly into commercial and industrial uses, will swell the total means of payment of the community, and so will make possible a bidding up of prices all along the line. Some of the new funds will go into collateral loans for the stock market. The funds thus furnished to corporations will be expended in the purchase of equipment, construction of plants, and disbursement of payroll, and will thereby augment the total means of payment of the community and so buoy up prices. Some of the new funds may be directly invested by the banks or loaned to customers for purchase of real estate or other noncommercial uses. In any event, new spending power passes into the hands of the public and is used to bid up the prices of goods.

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[1] This ratio assumes that currency expansion does not accompany credit expansion. However, to the extent that currency expansion is required, the primary expansion possible is only $1 of Federal Reserve notes or gold certificates to $1 of new gold reserve. Further secondary expansion by rediscounting would make possible an issue of $2.50 of currency to $1 of new gold reserves, but such secondary expansion is usually for temporary needs only.

In the earlier stages of this process, the main interest centers on the ratio of new gold to new bank credit. But as soon as the process reaches the stage where payrolls increase and retail trade expands, more hand-to-hand cash is required. This need will be met by allowing Federal Reserve notes or other forms of currency to enter circulation. The currency increase usually lags behind the credit increase and is an incidental outgrowth of it. Currency plays a subordinate rather than a dominant rôle.

Let us assume that the Federal Reserve Banks have acquired by import $10,000,000 of new gold, and that all of this sum has been used by member banks to augment their legal reserves. That is, the Federal Reserve ratio of new gold to new deposits (legal reserves of member banks) is 100 per cent. The minimum requirement under the Federal Reserve Act is 35 per cent. Obviously, there is leeway for further expansion before the legal reserve minimum is reached. This further possible expansion is commonly designated *secondary,* in distinction from the original or *primary* expansion. The secondary expansion would require an increase in the earning assets of the Federal Reserve Banks.

These assets are chiefly in the form of United States securities, bills bought in the open market, and rediscounts in the open market. If the Federal Reserve Banks increase their holdings of United States securities, they furnish the banks and the money market in general with new credits which may be counted as legal reserves for member bank expansion. Thus, if in the assumed case above, $10,000,000 of new securities were purchased, member banks would have available $20,000,000 of funds which could be utilized as permanent reserves. The ratio at the Reserve Banks of new gold to new deposits would be 50 per cent instead of 100 per cent, and the member banks would embark upon a secondary expansion of credit equal to the original or primary expansion.

If the Federal Reserve Banks refuse to take the initiative in this secondary expansion by refraining from purchases of additional government securities, the member banks may take the initiative by selling bills to the Reserve Banks in the open market or by rediscounting directly with the Reserve Banks. The selling of bills is limited because at any given time the supply available is limited. The rediscounting operation is highly flexible, but is subject to the important qualification that the proceeds are to be used for temporary accommodation only. A member bank which renews rediscounts indefinitely and stays in debt to the Reserve Bank is likely to stand in a bad light in the eyes of the Reserve Bank and to be severely criticized by fellow member-bankers. Administrative pressure and banking ethics forbid the use of rediscounts for secondary expansion of permanent character. Hence, *temporary* secondary expansion will be made possible by bills bought and rediscounts, whereas *permanent* secondary expansion will depend upon securities bought by the Reserve Banks.

The discussion up to this point has run in terms of a business situation which is assumed to be readily receptive to expansion. However, in fact, the receptivity of the community to expansion is by no means constant. It varies widely, for instance from phase to phase of the business cycle. Receptivity to expansion is greatest during the prosperity or boom phase of the cycle and least during the depression phase. The degree of receptivity of the community to new funds depends upon whether business is in a state of revival, prosperity, crisis, recession, or depression. New gold readily leads to rapid primary and secondary expansion during the first two phases of the business cycle, but may fail to do so during the last three phases. If the gold arrives when business is dead, its immediate effects on expansion may be negligible. Gold then may have to wait until a more favorable phase of the business cycle before exerting its full influence upon credit and prices.

The rounds of the business cycle may be traced in greater definiteness. (1) *Financial crisis or recession.* Newly imported gold is likely to be used to pay off rediscounts and reduce member bank indebtedness outstanding rather than to support new expansion. Secondary expansion is frustrated by high interest rates, fright among borrowers, and sale of United States securities by Federal Reserve Banks as a means of tightening the money market. (2) *Depression.* Not until some months after crisis does the tension relax. After depression or recession has to some degree run its course, new arrivals of gold will furnish the member banks with new reserves and tempt them to put the new funds to work by easy money and liberal accommodation. At some point during depression, the stage will be reached where easy money will be a fairly decisive factor in converting depression into revival. Moreover, secondary expansion will be facilitated as the Reserve Banks purchase United States securities in order to ease the money market, and lower the rediscount rate. Yet the secondary expansion will be limited by the tendency to lower rediscounts and bills owned in proportion to the increase in securities owned. If no net change in total earning assets results, secondary expansion will not be material. (3) *Revival.* New gold stimulates prompt primary expansion, at first in speculative loans, later in commercial loans. Secondary expansion begins to manifest itself in increased rediscounts and increased volume of open-market bills and securities bought by Reserve Banks. (4) *Prosperity.* New gold meets an eager response from borrowers. Loans and deposits of member banks rise rapidly. Secondary expansion, supported by rediscounts and bills bought, becomes important, but at an advanced stage is to some extent held in check by sales of securities owned or advances in the rediscount rate, or both.

From this brief account of changes in the receptivity of the business community to new credit, it must be apparent that the effect of new gold upon prices depends upon the ups and downs of business cycles. In the long run, gold will bring about not only primary expansion to the limit permitted by legal or customary reserves, but such secondary expansion as is permitted by central banks through increased permanent holdings of securities. Thus, the secular trend of prices will respond to the arrival of new gold but with a time lag determined by the position of the country in the business cycle.[1]

It is frequently claimed that the Federal Reserve Banks (or central banks in other countries) act as a buffer against inflation resulting from new gold supplies. Particularly in the United States it is asserted that the Reserve Banks have impounded or sterilized gold and so have prevented the extraordinary acquisitions of gold from inflating prices. In criticism of this doctrine, let us note that the Reserve Banks have not prevented primary expansion on the new gold reserves. Primary expansion has proceeded to the limit permitted by legal reserves. Nothing that the Federal Reserve authorities have done or can do has sensibly thwarted this primary expansion. These central institutions are not to any appreciable degree a buffer against such expansion.

Moreover, it is often claimed that, if the United States had not enjoyed the protection of the Federal Reserve system after 1922 when gold was imported heavily, inflation would have gone to extremes. If the pre-War National Bank Act had prevailed, it is said that inflation would have risen to remarkable heights. This notion arises from a serious misunderstanding of the two bank systems. Under the old system, primary expansion was possible,

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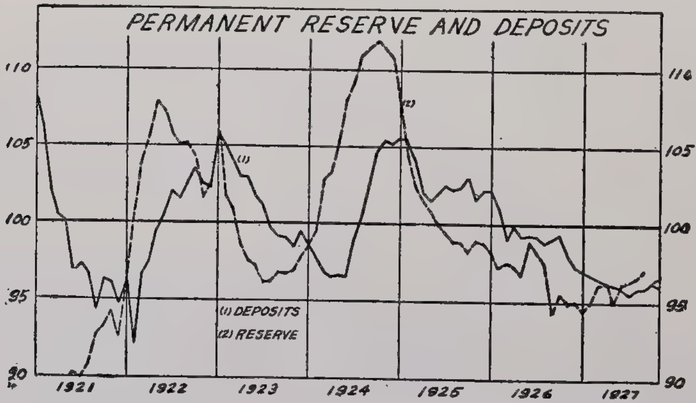
[1] This relationship from 1921 to 1927 is shown by the following chart. This chart should be compared with that on page 406, showing demand deposits of outside member banks and wholesale prices.

CHART NO 51



Reserve Gold Stock Plus U.S. Securities Owned by Federal Reserve Banks Expressed as Percentage of Trend of Growth
Deposits, Net Demand Deposits of Outside Reporting Member Banks Expressed as Percentage of Trend of Growth

but the legal reserve ratios were higher and the volume of credit that could be erected on a new dollar of gold reserves was less than that under the present system. In brief, primary expansion under the old Act was considerably less, per dollar of new gold, than under the present Act. Hence, primary expansion and price inflation is greater today than would have been possible under the old Act, not because of any policy on the part of the Federal Reserve authorities, but solely because of the lowered legal reserve requirements of member banks under the Federal Reserve Act. With regard to secondary expansion, we may observe that such expansion was impossible under the old system, since there was no central bank to furnish rediscounts or to buy bills and securities. Under the new system, secondary expansion is to a substantial extent under the control of the Federal Reserve authorities. They may buy or sell securities at will, and may regulate the volume of bills and rediscounts by raising or lowering rates. By keeping the volume of such earning assets down to moderate levels, the Federal Reserve authorities have resisted secondary expansion. This is all they have done or can do to act as a buffer against gold inflation. The writer would not minimize the importance of this service, but would point out its obvious limitations.[1]

2. *Favorable Balance of Trade.*—The influence on relative prices of a net excess of merchandise exports over imports, not offset by invisible items, may next be considered. A common example of this type of situation is an unusually good harvest in a given country accompanied by a limited harvest in other parts of the world. A heavy export of surplus farm products from the United States would give rise to an exceptional supply of bills of exchange and consequently to a fall of the exchange rate toward the gold import point. If the pressure of exports is mild and temporary it may result merely in a shift of bank balances or a

[1] It may be asked, can the Federal Reserve Banks act as a buffer against deflation in the event of a heavy loss of gold from the United States? The answer is that they can resist such deflation by increasing their holdings of United States securities. In this manner, they can offset a national decline in gold supply by maintaining an increase in securities owned. The legal reserves of member banks could thus be sustained at a rate of growth commensurate with the country's needs. Secondary expansion would cancel out primary contraction. If, however, the decline in gold supply were world wide, secondary expansion in the United States alone would be powerless to resist deflation. If world prices declined, United States prices would follow suit. Only world-wide secondary expansion could offset primary contraction.

transfer of the ownership of securities between countries. Or it may result in forward buying and dealing in futures among the speculators in exchange markets. Such speculators, anticipating in the not distant future a reversal of the movement of exchange rates, may smooth out the fluctuations of such rates by their operations. In some cases central banks of foreign countries may intervene to support exchange quotations of their currencies. Their intervention would be likely to take the form of utilizing some liquid assets which they already held in New York for the purchase of exchange drawn on them. By one or all of these methods the fall of exchange rates in New York may be checked. But if the pressure of the favorable balance of trade is persistent, these devices will be insufficient, and ultimately specie will have to be imported by the United States. The influence of the new gold will be asserted along the lines discussed in the preceding section. In general it may be said that the new gold will create primary expansion at the earliest favorable stage of the business cycle. At the same time that new gold adds to the reserve base, the large supply of bills of exchange arising from exports will be offered to banks for discount and will be conducive to an increase in the loans and deposits of such banks. In the final analysis, therefore, a persistent favorable balance of trade tends to raise prices by augmenting the volume of loans and deposits and of gold available as reserves.

3. *Borrowing Capital from Abroad.*—Let us assume that a given country borrows capital heavily from abroad over a period of several years and that the loans are not offset by interest payments or by repayment of principal, except in minor part. In other words, let us assume a net import of capital of sufficient duration to have a definite influence. The bulk of the proceeds will flow to the borrowing country in the form of merchandise. Only a minor part will be received in the form of specie. Prices will tend to rise in the borrowing country and fall in the lending country. A large supply of bills of exchange will accumulate in the borrowing country and this pressure will tend to drive exchange rates down to the gold import point. This supply of bills will also tend to increase the volume of loans and deposits in the borrowing country because the banks will be called upon to discount the new bills and the proceeds of such discounts will be placed on deposit to the account of customers.

The upward movement of prices in the borrowing country will differ in degree with respect to import prices, export prices, and domestic prices. The rise will tend to be lowest in import prices, somewhat greater in export prices, and greatest in domestic prices. The extreme rise of domestic prices will follow from the increased money-spending power of the borrowing country. The new funds will pass into circulation by the process of purchase of materials and disbursement of payrolls. The public, finding itself possessed of greater money incomes, will bid up the prices of goods in domestic markets. The expansion of bank credit may precede the inflow of gold. If it does so, the new superstructure of credit will lower reserve ratios to that minimum point which is viewed with apprehension by banks and the public, and the banks will seek to protect their position by advancing interest rates. The high rates, combined with the urgent need for additional gold reserves, will attract gold from abroad.

The new money-spending power will not materially affect the prices of imports because the demand of this one country is only a small incident in the world demand affecting the prices of imported articles. A greater volume of imports will be absorbed, but at prices not substantially increased. With regard to exports, the new money-spending power has the effect of absorbing at home some part of the merchandise which formerly was disposed of abroad. Hence domestic bidding for export merchandise will force export prices upward. However, the movement will be slow and uncertain because the export commodities have also a world demand and their price is to a substantial extent fixed by world markets.

The complex conditions which have been suggested are often covered up by the introduction of a great many extraneous factors. To the extent that other things do not remain equal, the price consequences will not be as clean cut and obvious as the discussion here assumes. However, the influences are present and do shape the course of events relative to what it would otherwise have been.

4. *Interest Rates.*—The influence of interest rates which are high or low relative to those of other countries depends upon a number of conditional factors. A relatively high rate tends to attract gold and bank funds from abroad, but it also tends to retard business activity at home. At certain phases of the business cycle, interest rates may be high enough to attract funds from

abroad, but not so high as to check prosperity at home. At other phases, rates may be low enough to stimulate revival of business activity, but not so low as to expel gold from the country. The effect of relative differences in interest rates must, therefore, be estimated with respect to the probable flow of gold, the probable development of the business cycle, and the probable expansion or contraction of bank credit in that cycle. No mechanical formula can be laid down, but each case must be studied by balancing the different elements as they exist at the time.

5. *Prices in One Country Below the World Level.*—If world prices are high relative to local prices, local prices tend to be brought into line by adjustments in the flow of specie and in the merchandise balance of trade. The country with relatively low prices is a good place in which to buy merchandise, but a poor place in which to sell. Consequently, such a country's imports will tend to decline and its exports to increase. This tendency means a favorable balance of trade in which the supply of bills of exchange in the one country becomes unusually large. The exchange rates under this pressure fall to the gold import point, and specie flows into the country. The new gold will facilitate a credit expansion and a rise of prices at the earliest favorable phase of the business cycle. Of course some attendant adjustments will also occur in interest rates and other international factors, but the primary adjustment is likely to take place through the balance of trade, specie flow, bank expansion, and price-increase mechanism. The final result is that local prices are brought into line with world prices.

6. *The Business Cycle.*—In a previous chapter dealing with business cycles emphasis has been placed upon the international similarity of movement. Although this world-wide pattern of business cycles is highly significant, nevertheless it implies that business prosperity gets under way earlier in some countries than in others and that financial crisis occurs in some countries earlier than in others. Each phase of the cycle is likely to be initiated at some one point and to spread with varying degrees of lag to other parts of the world. The international character of the business cycle is closely related to the international movements of prices. For instance, let us suppose that a business boom originates in a given country and that this country experiences a cyclical expansion of bank credit, a rise of prices, and a strong demand for merchandise. Other countries will immediately find this country

an excellent market; their exports to this country will increase and the prices paid for such exports will rise. Through this foreign trade mechanism a business boom will be stimulated in a number of countries, with its usual accompaniments of bank expansion and rising prices. This process will before long exhaust the reserves of certain countries and will lead to an advance in interest rates, a demand for gold imports and the fear of a general contraction of credit and business. Countries which suffer from an external drain of gold will find their bank reserves threatened and will put up interest rates as a protection to their reserve position. This action will in turn have its influence in warning the community against overexpansion and in retarding the business boom. It is obvious that all such international mechanisms imply the possibility of a major movement of bank credit prior to an inflow of specie. On existing gold stocks nearly every country has some leeway for bank expansion. This upward play of bank credit can take place early in the expansion phase of the business cycle and induce a subsequent inflow of gold. Obviously, the chronological order may proceed either from surplus gold to credit expansion or from credit expansion to specie imports. In the modern credit organization the specie flow frequently follows rather than precedes the credit expansion.

The present section has dealt mainly with conditions favorable to rising prices, but the theory is equally applicable to conditions favorable to falling prices. In the main, the initial disturbances leading to deflation are the converse of those leading to inflation. Owing to lack of space we shall omit a detailed analysis of the phenomena of falling prices, but the reader can easily fill in such an analysis by adapting the foregoing discussion to this particular end.

Some Factors Which Check a Rise of Prices and Induce a Fall.—A rise in prices cannot continue indefinitely. Eventually various strains and tensions appear which bring the price advance to a halt. Certain of these correctives of rising prices will be the next subject for discussion.

1. *The Gold Drain.*—Expansion finally approaches a point where the reserve ratios fixed by law or custom are threatened. The banks then raise interest rates as a means of checking the growth of loans and discounts. Moreover, the central bank often tightens money by selling some of its assets in the open market

or by raising its discount rate. These steps check the process of expansion, not so much because higher interest increases the expenses of production as because it reflects a reversal in the fundamental attitude of the banks. The banks become reluctant to renew some loans of old borrowers and discourage new borrowers; they place obstacles in the way of accommodating business men and so radiate a general sense of caution. The psychological effect is often to convert a state of optimism into a state of conservatism or even into a state of pessimism. These changes in the temper of the banks and of the public commonly owe their origin to the internal or external drain of cash, including gold.

The internal drain of cash arises from the fact that increased payrolls and retail trade require a large amount of hand-to-hand currency. Formerly, some of this currency was gold coin, but under post-War conditions it is primarily paper notes. The increased requirement for cash in circulation pulls down the reserve ratios of the banking system at a rapid rate in the United States. One dollar of gold will support only two and a half dollars of Federal Reserve notes, whereas one dollar of gold will support upwards of ten dollars or more of demand deposits (under primary expansion alone) among member banks. Hence when the member banks call for cash the drain upon gold is disproportionately great. This internal drain, therefore, accelerates the exhaustion of reserves and speeds the day when interest rates must be advanced to protect the reserves.

The external drain of gold arises from various possible combinations of circumstances. The rising prices characteristic of an expansion of credit and business may stimulate an adverse commodity balance of trade and so induce a fall of exchange rates to the specie export point. Some foreign country may have reached the stage of financial crisis and may therefore be bidding for gold by extraordinarily high interest rates. Although other factors may contribute to the external drain of gold, these two are usually the most important. The outflow of gold threatens to reduce reserves below the minimum of requirements, and forces an advance of interest rates and a general contraction of credit and prices.

2. *An Adverse Balance of Trade.*—As already indicated, the rising prices of an expansion period tend to stimulate imports and

retard exports, and so to create an adverse commodity balance. This situation forces exchange rates up to the specie export point, and generates an external drain of gold. The consequence, in the form of a check to rising prices, has already been stated in the preceding section.

3. *Interruption of the Net Import of Capital.*—If a country has been borrowing heavily and in consequence has been experiencing rising prices, certain counterinfluences are likely to appear in the course of time. The payment of interest and the repayment of principal may offset new loans. If this stage is reached, although borrowing continues, there is no net import of capital, and hence no tendency, as far as the borrowing process is concerned, for prices to continue to rise in the debtor country.

A more abrupt countermovement often occurs in the form of a sudden cessation of loans by the creditor country. This action may be influenced by a financial crisis in the creditor country which temporarily curtails its international banking activities. Such a change often precipitates a financial crash in the borrowing country. Having come to reply upon successive loans, the borrowing country is unable to adjust itself quickly to a stoppage of such loans. The result is a sharp fall in prices in the borrowing country, and a financial crisis or panic.

4. *Relative Difference of Interest Rates.*—An advance in interest rates at home checks the growth of business and attracts gold from foreign countries. An advance in interest rates abroad creates an external drain of gold and thereby forces the country losing specie to protect its reserve position by advancing interest rates.

5. *International Inequalities in the Business Cycle.*—After a world-wide boom has been under way for a time, certain countries experience a collapse of prosperity. This collapse imparts its influence to other countries through the medium of depressed markets, falling commodity prices, high interest rates, a drain of gold and the spread of a feeling of alarm.

6. *Restrictive Central Bank Policy.*—Central banks often pursue a policy calculated to resist excessive inflation. This policy may consist of an advance of the official rate of discount, of the sale of securities or other assets in order to tighten the money market, of the issuance of warnings intended to have a psychological effect, and of the use of liquid assets in foreign banking

centers to support the exchange rate. The mechanism of central bank influence has been discussed at numerous other points in this volume, and it is unnecessary to repeat the details of analysis here.

The present section has been devoted to the factors which check a rise of prices, but the theory is easily applied to the converse problem, mainly the factors which check a fall of prices. Although there are some differences of detail in the two problems, nevertheless fundamental analysis is the same. Owing to lack of space, we may omit an elaboration of the second problem, but the reader can easily modify the general theory to suit the case.

The Significance of World-Wide Changes in Price Levels.—In considering the detailed mechanism of international connections of prices, we should not lose sight of the fundamental significance of the problem. There is a very common disposition on the part of the public, and even on the part of some economists, to discuss the movements of prices as if they took place in a self-contained economy. Most financial literature grossly overemphasizes the strictly domestic phases of price fluctuations. There is a distinct tone of insularity in much of the current explanation of price movements. Most price fluctuations are attributed to changes in the efficiency and cost of operation of domestic manufacturing plants, or to local wage rates, or to profiteering, or to local tax schedules, or to excess plant capacity and over-production. It is true that all such factors have a bearing upon price movements, but when one views the world-wide similarity of price change, one begins to question the importance assigned to most of these domestic factors. Realism compels a high degree of internationalism in point of view on the part of the student of commodity price fluctuations. If the student is interested in a technique for predicting price trends, he must give consideration to the factors governing world-wide trends. If he is interested in the control or stabilization of prices, he must at all times act upon the premise that the price level of one country cannot be forced out of line with the world price level, if the various countries are to remain on a gold standard or a gold exchange standard. Obviously, the price level of a single country cannot be studied in isolation, but must be studied as an integral part of the world price structure.

Chapter XXI

INTERNATIONAL CONNECTIONS OF PRICES: INCONVERTIBLE PAPER STANDARDS

International Price Movements Under Inconvertible Paper Standards.—Thus far, the international connections of prices have been studied from the standpoint of countries operating on a gold basis. However, the discussion may be extended to numerous alternative situations. For instance, the international connections of prices between countries on a bimetallic standard might be considered. Since this type of situation now has chiefly an historical interest, we shall not include it in the present treatment. To take another type of situation, the price relations between a gold-standard country and a silver-standard country might be analyzed. However, there are only a few countries on a silver standard at the present time, and for want of space we shall omit discussion of this kind of situation. Again, the price relations between two or more countries all of which are on inconvertible paper standards might be considered. This situation is well illustrated by the countries of Europe during and after the World War. Finally, the relations between a gold-standard country and one or more countries on paper standards might be considered. This condition is illustrated by the United States in her relations for a decade or more after 1914 with European countries. The following discussion will focus on the last two types of situations, with special emphasis on relations between gold and paper standards.

The Gold Premium.—Under inconvertible paper, there usually has occurred an overissue of paper currency and a premium on gold. This premium can be estimated in two different ways. First, if a domestic market is maintained where gold bullion can be freely traded in, then the paper price of gold measures the premium on gold. This condition was fulfilled during most of the Civil War period in the United States. A gold market was operated, in which the price of gold was quoted in terms of depreciated greenbacks. When, on a certain date, two dollars of greenbacks were required to buy one dollar of gold, there existed a 100-per-cent premium on specie. A second method of ascertaining the premium is by use of the exchange rate as quoted in a gold-standard country. For instance, in post-War Europe the gold premium could be approximately estimated by taking the European paper prices of gold dollars as evidenced by foreign exchange quotations. The results of the second method will not always coincide perfectly with those of the first, but the differences will usually be small and temporary. Either method makes possible an estimate of the value of gold in terms of depreciated paper.

Paper Prices Adjusted to a Gold Basis.—Although the prices of goods in paper-standard countries after 1914 were no longer quoted in terms of gold, they could be reduced to a gold basis by making comparisons with prices in a country which was still on the gold standard. For instance, in France at the end of 1924 the wholesale price index in paper francs was 507 (1913=100). To reduce this index to a gold basis, we may multiply the paper index by the actual rate of exchange then prevailing, and divide the result by the old mint par of the franc (19.3 cents). The resulting gold price index is 142. On the same date the price index in the United States was 165. In other words, at current exchange rates and price levels, gold would have bought more goods in France than in the United States. The reduction of paper prices to a gold basis thus makes possible comparisons of the relative cheapness of goods in terms of gold in various countries.

Purchasing Power Parity.—A further method of comparison is the computation of what has come to be called the purchasing power parity. This parity may be defined as the rate of exchange at which the money of a given country would possess an equal purchasing power whether spent at home or converted into foreign money and spent abroad. From the standpoint of the United States after 1914, the purchasing power parity was represented by that rate of exchange necessary to give the gold dollar the same buying power over goods in a paper-standard country as at home. For the World War period, this parity may be estimated by multiplying the old mint par of exchange by the price index of the United States of a given month and dividing the result by the price index of a paper-standard country for that month. Applying this formula to the franc at the end of 1924, we obtain a purchasing power parity of 6.28 cents. At the same date, the actual rate of exchange was 5.40 cents. This discrepancy measures the advantage to the United States in purchasing French goods. Francs were a bargain to American importers. A given number of dollars would purchase more commodities if spent in France than if spent at home. When the actual rate is the same as the purchasing power parity, there is neither advantage nor disadvantage in spending money abroad rather than at home. It is only a deviation of actual rates from purchasing power parity which creates a trade advantage or disadvantage.

Unstable Exchange Rates.—Under inconvertible paper, exchange rates may show a range of fluctuation unrestricted by specie points. Indeed, one of the most pronounced characteristics of inconvertible standards is the inconstant level of exchange quotations. This inconstancy is in sharp contrast to the fixed mint par of exchange under a specie standard, with deviations from par only by a margin equal to the cost of shipping gold between countries. Under the gold standard, exchange rates are the most stable part of the mechanism of international price connections. But under the inconvertible paper standard, exchange rates are likely to be the most unstable part of the mechanism. The purchasing power parity itself is a variable parity. Owing to the method by which it is usually computed, it changes with every new inequality in the price indexes of the various countries.

Gold Movements Under Paper Standards.—The free and unrestricted gold market which had been built up during the nineteenth century was scrapped by European countries when the World War placed them under extraordinary financial strain. Export and import of gold was either forbidden outright or regulated by government licensing programs. The melting-down of gold was restricted in most countries, and the gold coin formerly in circulation was called in and centralized in the reserves of the banks. Where so many restrictions are imposed, there is difficulty in applying theories of international prices which are originally conceived to apply in a free market. In spite of this limitation, however, it is possible to trace the position of gold in the international mechanism of price adjustment. In general, we shall find that gold movements lose their corrective influence in the international mechanism. Where the paper standard prevails, the specie flow does not correct price-level inequalities between countries, and price inequalities do not require a specie flow. The internal drain of gold is cut off by virtue of the withdrawal of gold from circulation and the restriction of the melting-down of the metal. The external drain of gold is usually not altogether cut off, except at short intervals, but is subjected to a high degree of state regulation and control.

Let us consider first the effect of a gain or loss of gold on the price level of a paper-standard country. A gain of gold will not tend to expand bank credit or note issue because these means of payment are no longer conditioned by the specie reserve. They are not convertible into specie and their volume bears no fixed ratio to specie backing. Hence, an acquisition of new gold will have no effect upon the total means of payment outstanding, will not give rise to further inflation, and will not stimulate a further rise of prices. Conversely, a loss of gold will not tend to contract bank credit or note issue. The gold drain will not restrict the cash reserves of the banks since these reserves now consist of legal tender paper rather than of gold. Hence, the loss of gold will not correct inflation and will not force prices down. In fact, the loss of gold is likely to aggravate the inflation process rather than to remedy it. This likelihood arises from the effect of the gold drain upon the confidence of the people in the ultimate value of the money unit. Most countries which have abandoned gold have looked forward to the time when they could return to gold. Obviously, a drain of specie out of the banks postpones the date of possible resumption of specie payments and to that extent undermines confidence in money. As confidence in ultimate resumption wanes, people find it desirable to reduce their stock of ready purchasing power to as small a proportion of their income as they can possibly get along with. In other words, they tend to reduce their demand for money. This reduced demand lessens the value of the money, a process which is measured by the rise of prices and the rise of the gold premium. As prices rise, the people clamor for more units of money in order to carry on business at the new price level, and the government feels the necessity of issuing more notes and borrowing more bank credits in order to meet expenditures larger than were originally anticipated. As the new means of payment enters circulation, it enables the public to bid up the prices of goods and to pursue another round in the vicious spiral of inflation. By this chain of events, therefore, a loss of gold not only may fail completely to check inflation but also may positively make inflation more severe.

Having considered the effect of gold movements on prices in paper-standard countries, let us turn the matter around, and consider the effect of a rise or fall of prices on gold movements. If a country contracts inconvertible notes somewhat and reduces the volume of bank credit, the result may be a lowering of the domestic price level, but the entire deflationary strategy will not tend to check an outflow of gold or to bring about an inflow. The effect may solely be to alter the exchange rate. Of course, if the process were carried to the point of wiping out the gold premium altogether, it would put the country in a position where it could resume the gold standard. However, we are not at present assuming a deflation of this complete character. We are assuming a moderate deflation which still leaves the country with a pronounced gold premium. Under such a condition, a country cannot attract specie imports or check specie exports by the device of contracting and deflating the domestic currency. Contracting and deflating will tend to produce a proportionate rise of exchange rates abroad, and the new level of rates will tend to equilibrate the balance of payments without the intervention of a specie flow.

The converse of this proposition is that expansion of note issue and bank credit under a paper standard will not necessarily cause an external drain of gold or retard an inflow. Such expansion, with associated price increases, will tend to produce a proportionate fall of exchange rates, and the new level of rates will tend to equilibrate the balance of payments without the intervention of a specie flow. The exchange rates provide the mechanism of adjustment, and displace gold movements in that capacity.

Although gold thus loses its influence as a corrective of international price differences, nevertheless gold is not without influence along other lines. It may move between countries as a commodity, like any other article of merchandise which enters into the balance of trade. To the extent that it moves in this manner, it will modify the supply and demand of bills of exchange and through this mechanism will modify the rates of exchange. Hence, under inconvertible paper, gold movements will affect trade balances and exchange rates. But this effect does not require any accompanying change in the relative price levels of the several countries. In so far as gold enters the picture, it confines its influence to trade balances and exchange rates and exerts no direct influence over relative price levels.

This discussion of the rôle of gold movements under inconvertible paper necessarily oversimplifies the situation somewhat. The critical reader will observe many respects in which any short, general statements are untrue when applied to a situation as complex and extraordinary as that which accompanied the World War. Nevertheless, there is an advantage in sharpening the conceptual devices which the student must use in threading his way through these intricate problems. Each abstract proposition may be modified and qualified as each special and extraordinary situation may require. Each generalization may be subjected to numerous exceptions and reservations. But over and above all such specific applications, one needs broad and simplified principles for guidance. It is to meet this need that the present discussion is intended.

The Balance of Trade as Mechanism of Adjustment Under Inconvertible Paper.—Having observed that the specie flow mechanism loses cause and effect connection with international prices of paper-standard countries, we are faced with the problem of examining other mechanisms of adjustment which operate under inconvertible paper systems of money. Among the most important of these mechanisms are the balance of trade and the exchange rate. It may be laid down as a general proposition that the balance of trade will tend to adjustment in such a manner that the total money debits of a country will equal its total money credits. It is not necessary that paper prices be equalized with gold prices or that paper prices in one country be equalized with paper prices in another country. The equalization process consists of matching the total money remittances of a country against total money receipts. The exchange rate is the ratio at which this equalization tends to take place. The adjustment of exchange rates will tend to be such that the total money value (in the money units of the outside world) of all payment due a given country will be approximately the same as the total money value (in the money units of the given country) of all payments due the outside world from the given country.

Let us assume that a paper-standard country has developed a net excess of imports, that is, an unfavorable balance of trade. Under a specie standard we should expect an outflow of gold, a contraction of bank reserves and ultimately of bank credit, and a fall of prices. But under a paper standard, this specie flow mechanism does not operate. In its place, let us suppose that the large volume of imports gives rise to an unusual demand for bills of exchange at home and, conversely, an unusual supply of such bills abroad. These supply and demand factors will tend to raise exchange rates as quoted at home and to lower them as quoted abroad. This shift of exchange rates will automatically alter the cost of goods which enter into international trade. The home country, where exchange rates have risen, will pay more than formerly in order to obtain a given amount of foreign currency wherewith to pay for imports. For instance, let us suppose that the price of coal abroad is constant at $10 per ton, but that the exchange rate at home rises 10 per cent. The coal importer will have to put up 10 per cent more of domestic paper currency now than formerly in order to obtain the same ton of coal at the same export price as that price is quoted abroad. Obviously, export prices abroad may remain unchanged, but import costs at home advance, due solely to an advance in the exchange rate at home. Since the cost of imports has risen, the volume of imports will tend to be restricted. At this stage of the argument, we observe that an initial disturbance in the form of an excess of imports tends to institute an automatic corrective through the mechanism of higher exchange rates in the domestic market (conversely, lower rates in foreign markets), higher *cost* of imports although the *quoted price abroad* is unchanged, and consequent restriction of the volume of imports.

A counterpart of this corrective mechanism is found on the export side of the given country's balance of trade. The original adverse trade balance lowers exchange quotations abroad. This lowered rate enables foreign buyers to obtain the same amount of the given country's currency as formerly at a lower price. For instance, let us suppose that the given country exports cloth at $5 a yard and that this price remains unchanged. The exchange rate abroad having fallen, let us say, 10 per cent, the foreign buyer's cost will be only $4.50. The lowered cost of cloth to the foreign buyer will be possible even though the quoted price of cloth in the producing country is still $5 a yard. With import costs cheapened, foreigners will tend to buy more imports. From the standpoint of the home country, this means an increase of exports and a drift toward a favorable balance of trade. Thus, the outcome of the whole matter is that an initial disturbance in the form of an adverse trade balance sets in motion an automatic corrective in the form of altered exchange rates, and that this corrective leads to the building up of a favorable trade balance. The automatic corrective works itself out without any change in the relative domestic or export price levels of the paper-standard countries. It changes the import costs of merchandise through the alteration of exchange rates, but does not substantially modify the general price levels. If price levels of the respective countries were unequally inflated at the start, they will remain so. The mechanism of adjustment does not wipe out inequalities in international prices; it compensates for such inequalities by adjustments of exchange rates and trade balances.[1]

Flooding the Foreign Market With Cheap Exports.—After the World War, the United States took alarm lest certain European countries having depreciated paper standards might flood the United States with cheap exports. This alarm led to an investigation by the United States Tariff Commission, with the following results:

> For standard products having a world-wide market [for example, wheat, copper, cotton, tin, pig iron], the exchanges have worked themselves out to a gold basis to such an extent that international trade is little disturbed by price discrepancies due to depreciated exchange. Articles having a free international market have about the same gold

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[1] It will of course be recognized that these inferences will be strictly true only under certain fixed assumptions. One such assumption is that the volume of domestic currency is not being inflated by excessive expansion of notes and bank credit. Another is that budgets are being balanced out of current revenues and that confidence in the monetary system is sustained. Another assumption is that unusual bearish or bullish speculation in the exchange markets does not occur. Another is that invisible items in the balance of payments undergo no substantial disturbance. Another is that no arbitrary restrictions are imposed upon the free movement of trade and exchange rates. The assumptions might be multiplied at greater length, and the reader might reach the opinion that the assumptions are so numerous as to prevent the conclusions from having much value. However, this possible objection to the analysis is superfluous, since no claim is made that these brief abstract propositions cover all conceivable combinations of circumstances. These propositions furnish conceptual devices by means of which the student can work out the complexities of actual experience. For an elaboration of the discussion, the reader should consult more general literature on the theory of international trade under a paper régime. For instance see TAUSSIG, F. W., *International Trade*, 1927, part III, and ANGELL, J. W., "International Trade Under Depreciated Paper," *Quarterly Journal of Economics*, vol. XXXVI, 1921–1922, pp. 359–412.

price the world over, transportation and taxes aside, no matter whether the quotations are in dollars, francs, pounds, or marks. A dealer in copper, wheat or cotton, for example, may say with truth that the exchange situation has been discounted in the price of his products and that only the daily fluctuations cause him trouble. A dealer in highly specialized products such as artificial flowers, toys, or articles of fashion, may say with truth that the depreciated exchange is almost a decisive factor in his business. Many articles such as aluminum goods, pottery and chinaware or specialized chemicals and metallurgical products which either do not enter largely into international trade or whose prices are adjusted slowly, show a great divergence of gold prices in the chief markets of the world.[1]

This report indicates that the fear of world-wide dumping of cheap goods by countries operating under inconvertible paper money was largely unwarranted. The bulk of goods having well-organized international markets were so priced that when exchange rates were taken into account the cost was approximately uniform in all markets. A three-cornered adjustment in the paper price of the exporting country, the gold price in the importing country, and the exchange rate between the two countries brought about a substantial equalization in the cost of the product no matter where it was purchased. The situation was somewhat different when goods having imperfect international markets were considered. There was often a discrepancy between the rise of the paper prices of such goods and the depreciation of exchange. If exchange had depreciated more than prices had risen, the foreign buyer of the goods obtained them at a relatively low import cost. The goods were made cheap by virtue of the depreciation of exchange in excess of the inflation of prices in the producing country. However, in spite of this discrepancy, the European countries were not in a position to flood the outside world with cheap merchandise for the good and sufficient reason that they lacked the capacity to produce any such flood of merchandise. Those countries were impoverished by the War and their productive capacity was below pre-War levels. They lacked the sheer physical capacity to produce a mass of cheap goods for sale among outside countries. But even if they could have produced the goods, there would have been an automatic corrective to over-expansion of foreign sales. The growth of exports and of a favorable trade balance would have given rise to a large demand for bills of exchange in foreign centers. This unusual demand for bills would have driven exchange rates upward, thus wiping out the discrepancy between the fall of exchange rates and the rise of prices. In the final analysis, the fear of a flood of cheap goods emanating from depreciated paper countries was unwarranted.

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[1] *Depreciated Exchange and International Trade*, 1922, p. 7.

Exchange Rates When Unequal Inflation is the Primary International Variable.—During a period when price inflation is progressing rapidly and unequally in various countries, the doctrine of the purchasing power parity has special significance. This type of situation is illustrated by the course of events following the World War. Government and bank officials were disposed to place the blame for depreciated exchanges upon nonmonetary factors, such as adverse trade balances or bearish speculation in exchange by enemies of the country. They were loath to admit that the overissue of notes had anything to do with depreciated exchange. At this crucial stage, Gustav Cassel and others engaged in a campaign of world-wide education on the importance of inflation as a cause of depreciated exchange. Their effort contributed to the ultimate realization by the public that the first step in the restoration of normal exchanges must be a restriction of note issue and of government borrowing as a means of balancing budgets.

Exchange Rates When Trade Balances Are the Primary International Variable.—Let us assume that internal paper prices have settled down to a fairly constant level and that trade balances are the chief international variable. Let us further assume that the trade balance of a given country is disturbed by a process of heavy borrowing of capital over a period of several years. As we have previously seen, if this process were to take place under a gold standard, the probable result would be a rise of prices in the borrowing country. But if the process were to occur under a paper standard, the probable result would be a fall in domestic exchange rates but no material change in domestic prices in the borrowing country. There would tend to be a fall of import costs in the borrowing country growing out of the lower cost of exchange. There would also tend to be some weakening of export prices in the borrowing country, since foreign buyers would be unwilling to go on buying goods at former prices plus the added cost of exchange. The depression of export prices in the borrowing country would in some measure cancel the rise of exchange rates abroad. Adjustments of similar kind would be expected from disturbance of the trade balance by unusually large exports from a paper country, arising from excellent harvests in that country or from a greater world demand for the products of that country.

Under any of these conditions, the doctrine that a purchasing power parity calculated in the usual manner is somehow a "normal" exchange rate, is open to criticism. For instance, after the World War such parities were computed by finding the quotient of the price levels of two countries relative to a 1913 base and a 1913 mint par of exchange. Parities computed in this manner are normal only so long as 1913 trade balances, invisible balances, demand schedules, and states of confidence, continue unaltered When all of these factors depart widely from the pre-War norm, exchange rates cannot be expected to conform to a purchasing power parity calculated on that norm as a base period.

We may contrast the adjustment expected under paper standards with that expected under specie standards. In the latter case, we should expect the borrowing country to experience a general rise in prices, most marked in domestic prices and least marked in import prices. In the former case, we should expect the borrowing country to experience a mild fall in the general price level, marked by unchanged domestic prices but by a fall in import and export prices. Thus, the effect of unusually large incoming payments under a gold standard is to raise the general level of prices; but under a paper standard, to lower the general level somewhat.

Prices and Exchange Rates Under Extreme Depreciation.—The period after 1914 was characterized by progressive depreciation to an extreme degree. The behavior of exchange and prices under such abnormal conditions presents certain problems which would not be particularly important under more settled conditions. One such problem has taken the form of a dispute as to the cause and effect relations between prices and exchange rates. Adherents of the purchasing power parity doctrine have maintained that exchange rates rise in a depreciated paper country because the internal price level has risen or is expected to rise in the near future. Exchange rates are effect, internal inflation is cause. Critics of that doctrine have pointed out that usually exchange rates preceded price movements and were major causes of internal inflation. As we have seen in tracing the experience of such countries as Germany and Austria,[1] there is a point in the advanced stages of inflation when confidence in the currency weakens both at home and abroad. At such a point, there occurs a flight of capital to foreign countries and a tremendous bearish speculation in exchange at home and abroad. These developments are immediately apparent in an extreme fall of the paper country's exchange abroad and, conversely, in an extreme rise at home. This disturbance is transmitted to the internal price level. The rise of exchange means a greater cost of foods, raw materials, and other articles imported by the paper-standard country. Importers pass the cost on to domestic dealers and consumers by advancing the internal prices of merchandise. The practice of marking internal prices up or down to correspond with the daily fluctuations of exchange becomes widespread. By such processes, the depreciation of exchange precedes and causes price inflation. But as internal prices go up, the public clamors for more units of paper money in order to carry on business at the new price level. Moreover, the government finds that expenses have increased as prices have advanced, and proceeds to print more notes and borrow more heavily from the banks in order to balance the budget. Hence, the complete sequence is unbalanced budgets, currency inflation, loss of confidence, bearish speculation, flight of capital, depreciation of exchange, further internal price increases, renewed budgetary deficits and renewed borrowing and note issue by the government. Obviously the dispute as to which is cause and which is effect depends upon the point in the vicious circle at which we start. If we start with the chief initial disturbance, namely, the fiscal policy of meeting budgetary deficits by note issue and by borrowing from the banks, and trace the consequences of this disturbance all along the line, we discover that both exchange rates and prices were dominated by this common factor. Sometimes exchange rates anticipated future deficits, note issues, and price increases; sometimes exchange rates lagged behind these other elements. But the question as to which came first and which came last tells little of cause and effect. Both rates and prices were in large measure effects of a common initial disturbance in the form of fiscal deficits and government borrowing.

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[1] See above, pp. 312-318.

The Secular Trend of Paper Prices.—Under paper standards, countries may have highly divergent long-time price trends. One country may stabilize internal prices, while some of its neighbors are having a long-time advance of prices and others of its neighbors are having a long-time decline. Exchange rates and trade balance would shift in such manner as to equilibrate the total incoming and outgoing payments of each country. There are no international connections of prices tending to maintain uniform price levels in the various countries. If one country decides to stabilize paper prices, there are no international connections of prices which obstruct such a policy. There is no world-wide trend of paper prices to which all countries must conform. The price trend is peculiar to each country. The individual nation can at will raise, lower, or stabilize paper prices, regardless of what the rest of the world is doing. The independent self-determination of the price trend by each country is a cardinal characteristic of the inconvertible paper standard.

Paper Prices and the Business Cycle.—We have already noted the marked similarity of price movements in various countries with respect to the business cycle, when the gold standard prevails. We have now to observe international price relations with respect to the business cycle, when paper standards prevail. Under the latter condition, the external drain of gold and the consequent restriction of reserves, advance of interest rates, and limitation of credit expansion cease to function as a regulative mechanism. The price-specie-credit volume chain of international connection is broken.

When we examine the record of what has happened in paper-standard countries, we are confronted with the obvious fact that an international rise and fall of paper prices does take place and bears a marked relationship to the business cycle. The reader may observe this phenomenon by inspecting the chart of British and American prices on page 214. Comparison of prices in the two countries during the Restriction Period, the greenback period, and the World War period reveals a genuine similarity of cyclical fluctuations. This similarity is found on a world-wide scale in the great crisis and depression of 1920. Practically all countries of the world experienced a price deflation during 1920. In Germany and a few other countries the deflation was relatively small, and inflation was quickly resumed; but for a time and to an appreciable degree, the international depression dominated prices even in countries of extreme inflation.

Since the international connections of paper prices in the business cycle cannot be explained by the specie flow analysis, we must seek for the explanation in other mechanisms of adjustment. For purposes of illustration, we may focus attention on the crisis or recession phase of the business cycle. Why does recession or crisis in one country, with its attendant fall of prices, tend to precipitate a simultaneous fall of prices in other countries on a paper standard?

Several lines of connection may be mentioned. First, the heavy liquidation of commodities characteristic of this phase of the cycle involves a mass of commodities which are internationally traded in. A slump of demand in one market means by that much a slump in world consumption. Since, as has previously been pointed out, costs of internationally traded articles tend to uniformity in all countries when exchange rates, shipping costs, and prices all are considered, a slump in the price of a commodity at one point, unaccompanied by a proportionate fall of exchange rates, will tend to produce a slump of the price in the world market. Uniformity of cost of the internationally traded commodity will thereby be maintained. But it is a uniformity brought about by price decline and depression in all countries. In the process the prices of internationally traded articles furnish a line of contact between important price groups in all countries and contribute to a cyclical uniformity of movement.

Closely related to this price connection is the foreign commerce connection. Domestic prosperity is interwoven with the prosperity of those industries which cater to export trade. If an export market collapses because of business crisis abroad, the exporting country suffers a decline of sales, profits, and employment. In turn, the producers for export buy less raw materials at home and so radiate the depression throughout the organization of domestic trade. The ultimate outcome is a general slowing down in buying and a general decline of prices.

Finally, there is an international psychological connection of prices. Business failures, bank insolvencies, financial strain in one country give rise to alarm and caution in other countries. The bankers may take steps to protect their position by advancing interest rates and rationing credit to borrowers. Manufacturers and dealers may shift from forward buying to hand-to-mouth buying. Merchants carrying high-priced inventories may seek to dispose of them before the expected crash of prices ensues. This temper of the community helps to precipitate the very collapse of prices which has been anticipated. The ramifications of the psychological factor are too complex to be more than suggested in this brief paragraph, but their importance is obvious.

From this bare sketch of the cyclical sensitivity of prices in paper-standard countries, it should be apparent that abandonment of the gold standards does not isolate a country from the world business pulse. A paper standard is not immune from the vicissitudes of the business cycle in other countries.

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Chapter XXII

CONTROL OF THE PRICE LEVEL

The Purpose of Control.—The desirability of stabilizing the purchasing power of money has been stressed by the majority of writers on monetary problems. This objective has been championed not only by contemporary students, but by students of earlier periods. The concrete economic and social advantages of stability of the purchasing power of money have been discussed in Chapter IV, and need not be reiterated at this point. The present chapter is not concerned with the soundness of the objective. It assumes the validity of the ultimate goal, in light of the discussion running through the earlier portions of this treatment. The present chapter is devoted to the ways and means of attaining the objective. It is a discussion of methods and plans of action.

Synopsis of Theory of the Value of Money.—As soon as one examines critically the various plans for control of the price level, one discovers the necessity for a suitable theory of the value of money. The writer, sensing this necessity, endeavored to draw upon existing theories of the value of money. Unfortunately, for the particular purpose of guidance in price control, the existing theories seemed to have serious shortcomings. The writer has, therefore, sought to reconstruct monetary value theories with a view to providing a more useful instrument for the project of control of the price level.

The two most widely accepted theories of the value of money may be classified as the quantity theory and the anti-quantity theory. The classification is arbitrary, but it squares with the division of interest manifested by authorities in the field. The quantity theory is most familiar in the form—other things remaining equal, an increase in the quantity of money will cause a proportionate increase in the general average of prices. Although no quantity theorist would contend that other things do actually remain equal, no spokesman for that school has succeeded in giving anything like an adequate and satisfactory account of the other things which do not remain equal. The anti-quantity theorists differ among themselves in many respects but agree at least in this fundamental contention,—prices rise first and tend to cause a subsequent increase of money in order to carry on business at the new level. The initial disturbance of prices is usually attributed either to a shift in the value of gold bullion viewed solely as a commodity; or to a shortage of goods or an unusual demand for goods; or to psychological factors such as changed optimism, pessimism, confidence and expectation of the community; or to policies of the state in arbitrarily fixing the value of money.

Neither the quantity doctrine, as it is usually understood, nor its antithesis, gives satisfactory results when certain criteria are set up. This limitation may be illustrated by the following four criteria: (1) The hypothesis of monetary value should be susceptible of quantitative verification or disproof; (2) An institutional complement to static laws is required; (3) A theory of value of money should be useful in prediction of prices; (4) Such a theory should also be useful in a program of control and stabilization of the price level.

We may consider very briefly each of these criteria of a value theory. (1) The hypothesis should be susceptible of quantitative verification or disproof. Most of the statistical investigations to date merely go to prove that $MV = PT$. But this is a truism to start with, and statistical proof of it is superfluous. Some statistical research has been intended to demonstrate that M precedes P and is therefore the cause of P. As the writer has previously stated, none of these statistical studies affords satisfactory proof to those not already predisposed to the quantity doctrine. The statistical disproofs offered by opponents of the quantity theory are equally unconvincing. This outcome has led to the view that the quantity theory comes under the heading of those abstract propositions that have to be restated before they lend themselves to quantitative testing. In its most general form, such a restatement might be made as follows: The sequence and amplitude of changes in prices and the means of payment shift from phase to phase of inflation and deflation. The task of quantitative research is to define the various phases of inflation and deflation, and to measure the sequence and amplitude of changes in prices and the means of payment with respect to each phase.

(2) An institutional framework involves descriptive and his-

torical detail relating to use of specie, currency, and credit, to reserve ratios, to interest rates, to money markets, to bank organization, and to central bank policy. But mass accumulation of such detail is confusing and futile unless the information can be reduced to fairly definite relationships between the factors in the money-price equation. This end has been attempted in the present treatment by studying the data in terms of standard time series—secular, cyclical, seasonal, and irregular movements.

The result of this approach may be briefly summarized. The long-time movement of prices in gold-using countries follows the deviation of actual gold money supply from secular trend requirements, estimated at about 3 per cent per annum during the 75-year period prior to the World War, and tentatively estimated at about 2.7 per cent per annum after the War period. The cyclical movement of prices shifts its relation to money and other factors from phase to phase of the business cycle,—that is, with respect to depression, revival, prosperity, crisis, recession. The seasonal movement of general averages of prices is so small as to be negligible. The irregular movement of prices, as illustrated by certain War periods, shifts its relation to money and other factors from phase to phase of suspension of specie payment, inflation, deflation, devaluation, and resumption of a specie basis. These types of fluctuations have been discussed at length in preceding chapters.

(3) To aid in the prediction of price movements, a theory of the value of money should differentiate between the various types of such movements. The writer is not presuming any endeavor to forecast the future course of prices with absolute certainty and accuracy. Nevertheless, he does wish to face frankly the fact that everyone has to make certain assumptions about the probable trend of prices and to act upon those assumptions. In other words, we have to make price predictions and to rest important decisions of policy thereon. The only question is how to insure that the predictions shall be as reliable as possible. Specifically, we have to make assumptions as to the secular trend of prices, the cyclical movement, and the irregular movement. To meet this pragmatic requirement, the classification of data in the form of time series is indispensable. Analysis of the shifting relations of prices, money, and related factors from one

phase of inflation and deflation to another affords the basis for a technique of price prediction.

(4) Control of the price level likewise requires a classification of price movements according to time series. Stabilization of the secular trend of prices raises problems quite different from those raised by stabilization of the cyclical movement. War-time control under inconvertible paper standards raises problems in many respects peculiar to abnormal periods. The present chapter is confined to the discussion of control of secular and cyclical movements. Control of irregular fluctuations, as illustrated by certain War periods, has already been discussed in some detail in chapters XIV, XV, and XVI, and the problem need not be reconsidered in the present chapter.

Reviewing the four criteria of an adequate theory of the value of money, the reader will observe that the chief positive endeavor of the present treatise is the development of a theory—(1) which lends itself to quantitative investigation; (2) which by an institutional approach traces the shifting relationships of prices, money and other factors from phase to phase of business cycles, irregular movements, and secular trends; (3) which improves the technique of prediction of the major types of price movements; and (4) which furnishes the theoretical groundwork for a plan of control of the purchasing power of money.

Blocking Out the Problem of Control.—In sizing up the problem, we are confronted with a number of important questions. Preliminary decisions on these questions are necessary before we are ready to support or condemn any specific plan of action. The following list of such questions, while far from exhaustive, should make it possible to block out the main elements in the problem of stabilization of prices.

(1) What is meant by the word, *stability?* The word should not imply absolute fixation of the price level. Surely no one would be so foolhardy as to suppose that complete stagnation of prices is contemplated. To state the proposition reasonably, stabilization means eliminating the excessive and violent fluctuations which have so frequently occurred in the past. It means moderating the disturbances of inflation and deflation, smoothing out the peaks and valleys of price history, applying the brakes when a rise of prices threatens to go to extremes, and applying a stimulus when a fall of prices threatens to go to extremes.

Although it is difficult to name any mechanical limits of fluctuation, let us suppose that a rise or fall of 3 to 5 per cent were adopted as apprehension points, and it were decided to apply brakes or stimulants to prices whenever they threatened to go beyond these zones. Some such flexible stability would afford at least the basis for safe experimentation at the outset, and trial and error could gradually evolve more precise maxima and minima of price fluctuation.

(2) What types of fluctuations are to be subjected to control? Control may extend to the secular trend, to the business cycle, or to both. If to the secular trend alone, then it involves stabilizing prices against shortage or excess of gold production under given conditions of economy in the use of gold. If to the business cycle alone, then it involves stabilizing prices against the excesses of prosperity and depression. If to both, then it involves a combination of plans of control looking both to the long- and short-term course of events.

A comprehensive plan of control would aim to stabilize both secular and cyclical movements. It would aim to prevent the recurrence both of such long-swing movements of prices as those from 1873 to 1896 or from 1896 to 1914, and such short-time oscillations as those surrounding the crises of 1907 or 1920.

(3) What are the objectives of control? Advocates of stability in the standard of value stress the importance of eliminating injustice between debtors and creditors; of protecting the savings of the thrifty against loss through monetary depreciation; of reducing the amplitude and duration of the unemployment cycle; of sustaining a good physical volume of production freed from the speculative stimulant of rising prices or the depressant of falling prices; of prolonging conservative prosperity and shortening depression; of preventing one class of income receivers, such as agriculture, labor, landlord, investor or *entrepreneur,* from gaining at the expense of others solely as a windfall of unstable money; and of averting the social friction and unrest characteristic of periods of unstable money. Each of these objectives may be further subdivided with reference to the secular as distinct from the cyclical type of fluctuation.

(4) What would be the time sequence between control and prices? Control anticipates prices. It aims to check an expected fall or rise. It involves, therefore, some prediction of the future

tendency of price change. It requires action before the probable change actually occurs. As the Federal Reserve Board has explained:

> When the business outlook is inviting, business men are apt to adventure and new business commitments are made in increasing volume. But only later will these commitments be reflected in the possible rise of prices and an increase in the volume of credit provided by the commercial banks of the country. The Federal Reserve Banks will not to any considerable extent feel the impact of the increased demand for credit until the whole train of antecedent circumstances which has occasioned it is well advanced on its course; that is, until a forward movement of business, no matter from what impulse it is proceeding, has gained momentum. Credit administration must be cognizant of what is under way or in process in the movement of business before it is registered in the price index. The price index records an established fact.[1]

Consequently, a plan of control is no stronger than its technique of price forecasting. This technique must provide reliable assumptions about both the secular trend and the cyclical fluctuation which would tend to occur if the control mechanism were to be lifted. Control, to be effective, must be applied before the predicted movements actually materialize.

(5) How would the stabilization plan be affected by the international connections of prices? There are very narrow limits to the price stabilization which any one gold standard country acting by itself can accomplish. If, for example, one country undertakes to hold prices stable while prices in other gold-standard countries are falling, imports will be encouraged, exports discouraged, gold will be drained out of the country, exchange rates will threaten to move beyond the specie points, and bank reserves will fall below the minimum requirement. The stabilizing country will thus be brought to a point where it must decide between a stable price level and a gold standard. It cannot have both, as long as it acts as a single nation.

Stabilization under a specie standard requires international concerted action. A stable gold standard waits upon coöperation, agreement, or informal unity of action in some form among the leading nations of the world. Pending such an agreement, any single nation determined to have a stable money must cut itself loose from the gold standard.

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[1] *Annual Report*, 1923, p. 32.

But if a single nation secures price stability in this manner, it will do so at the sacrifice of exchange stability. It elects stability of domestic prices in preference to stability of foreign exchange rates. A fixed mint par, with specie points in narrow range, disappears, and a fluctuating exchange rate ensues. If a country fixes the internal level of prices and the world level falls, the country's foreign exchange will depreciate in rough proportion to the discrepancy between its price level and the world price level.

The problem comes down to this: Either a country must wait for international action or must divorce itself from the traditional gold standard. Proposals for following out each of these alternatives have been offered by various authorities. They will be discussed later in the present chapter. For the time being, it is sufficient that the reader realizes the general limits imposed upon price control by the international connections of prices.

(6) At what level should prices be stabilized? Selection of approximately the existing price level has the distinct advantage of achieving stability without serious initial disturbance to the money economy. Since the World War, some advocates of stabilization have urged selection of the pre-War price level. Such a policy has been urged on the ground that it would remedy the injustice to pre-War creditors, investors and savers resulting from depreciation of the unit of account. But if this remedy were adopted, it would inflict new injustice on all debtors who have contracted debts since 1914. It would set up new wrongs in order to right old wrongs. There is definite advantage in accepting the *status quo* as a starting point.

But in defining the *status quo,* recognition needs to be made of the phase of the business cycle which prevails at the time. Neither the top of prosperity nor the bottom of depression offers a sound permanent price level. Some median point is required. Future mild waves of prices above and below this point might be permitted, as a form of reasonable cyclical flexibility, but the secular trend would be approximately a horizontal line projected from this starting point.

(7) What index number of prices should be selected as a basis for control? The selection of a suitable index number has given rise to a large literature of discussion, but the problem has not

been solved in a manner which would receive the agreement of competent authorities. Some have suggested index numbers which would measure the purchasing power of money over utility or satisfaction. Others have suggested index numbers which would measure the purchasing power of money over sacrifice, labor, psychological cost. Either of these proposals would aim at a measure of subjective elements. They do not lend themselves to statistical averages and so meet insuperable practical obstacles when the task of computation of index numbers is approached.

Another proposal has been to measure the value of money in terms of "all things which bear a price,"[1] "of the aggregate of purchasable commodities in the widest sense."[2] This theory is represented in the composite index number prepared by Carl Snyder. A further proposal has been to prepare an index number "based on all commodities, weighted in proportion to their consumption."[3] A wholesale index weighted according to consumption or a cost-of-living index weighted according to budgets, would meet the requirements of this proposal. Finally, the proposal has been made to adopt an index number of wholesale prices weighted according to value or quantity of product. Most of the wholesale price indexes in common use fall within this class.

The chief contenders for supremacy appear to be a composite index, a cost-of-living index, and a wholesale index. The relative merits of these classes of index numbers may be appraised by a critical study of their respective movements during the past half century.

Chart number 32 presents the long-time trend of general wholesale and cost-of-living indexes from 1875 to 1896. Indexes of wages and of rents have been added for the purpose of comparison.[4] Each series has been adjusted to 1875 as a base of 100. The top portion of the chart, showing the annual averages, indicates the cumulative spread of the several groups. Wholesale prices fell to an index of 58 in 1896, whereas wages rose to an index of 110. The secular trend of the general average was definitely downward.

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[1] See Nicholson, J. S., *Money and Monetary Problems*, 1888 edition, p. 342.

[2] *Ibid.*, p. 320.

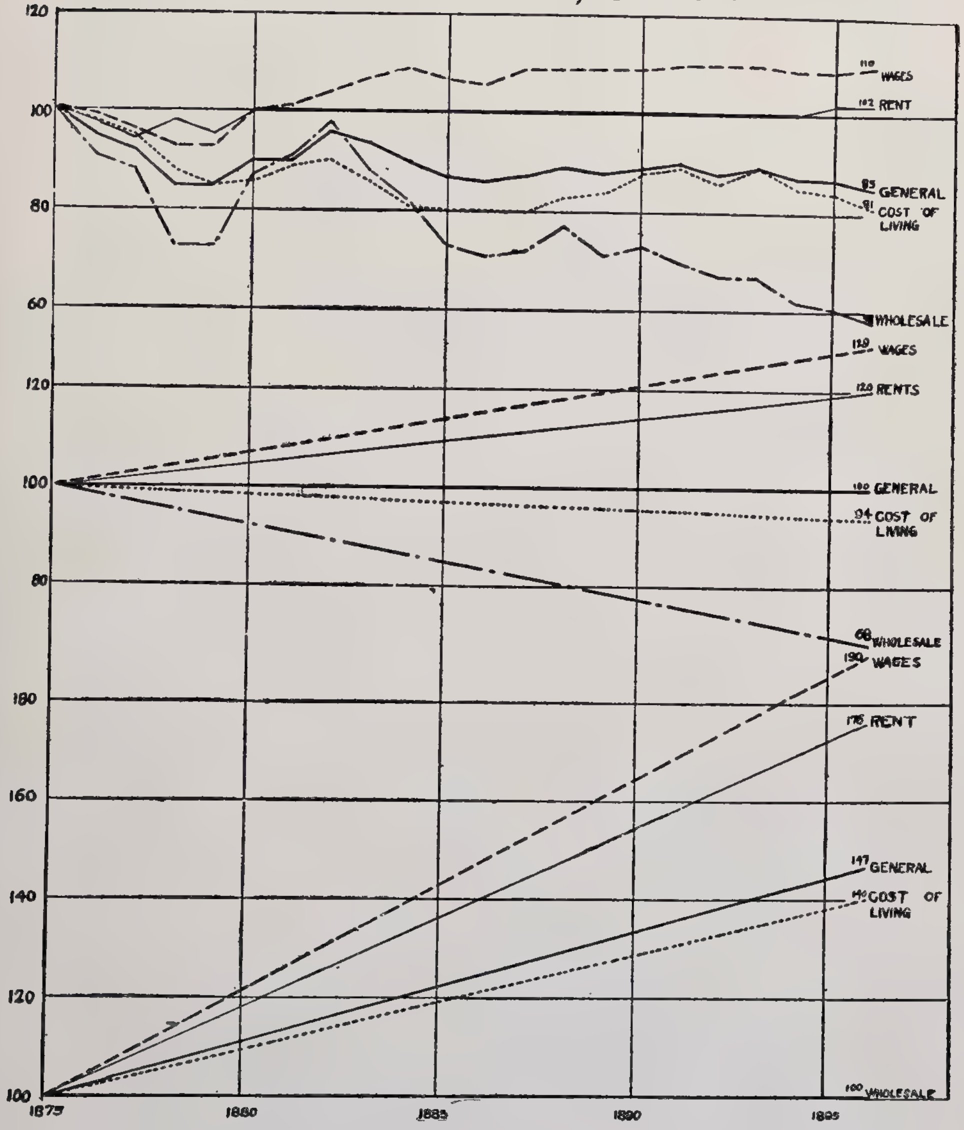
[3] Hawtrey, R. G., *Currency and Credit*, 1923, p. 420. See also Marshall, Alfred, *Money, Credit, and Commerce*, 1922, pp. 21, 30, 32.

[4] For source of indexes, see Snyder, Carl, *Business Cycles and Business Measurements*, 1927, pp. 286–291.

The middle portion of the chart shows the same five series as they might have appeared if the general average had been stabilized. The differentials between all groups are the same in 1896 as they were in the actual indexes at the top of the chart, but they are expressed relative to a constant general index of 100. The yearly averages for 1896 and for 1875 are connected by straight

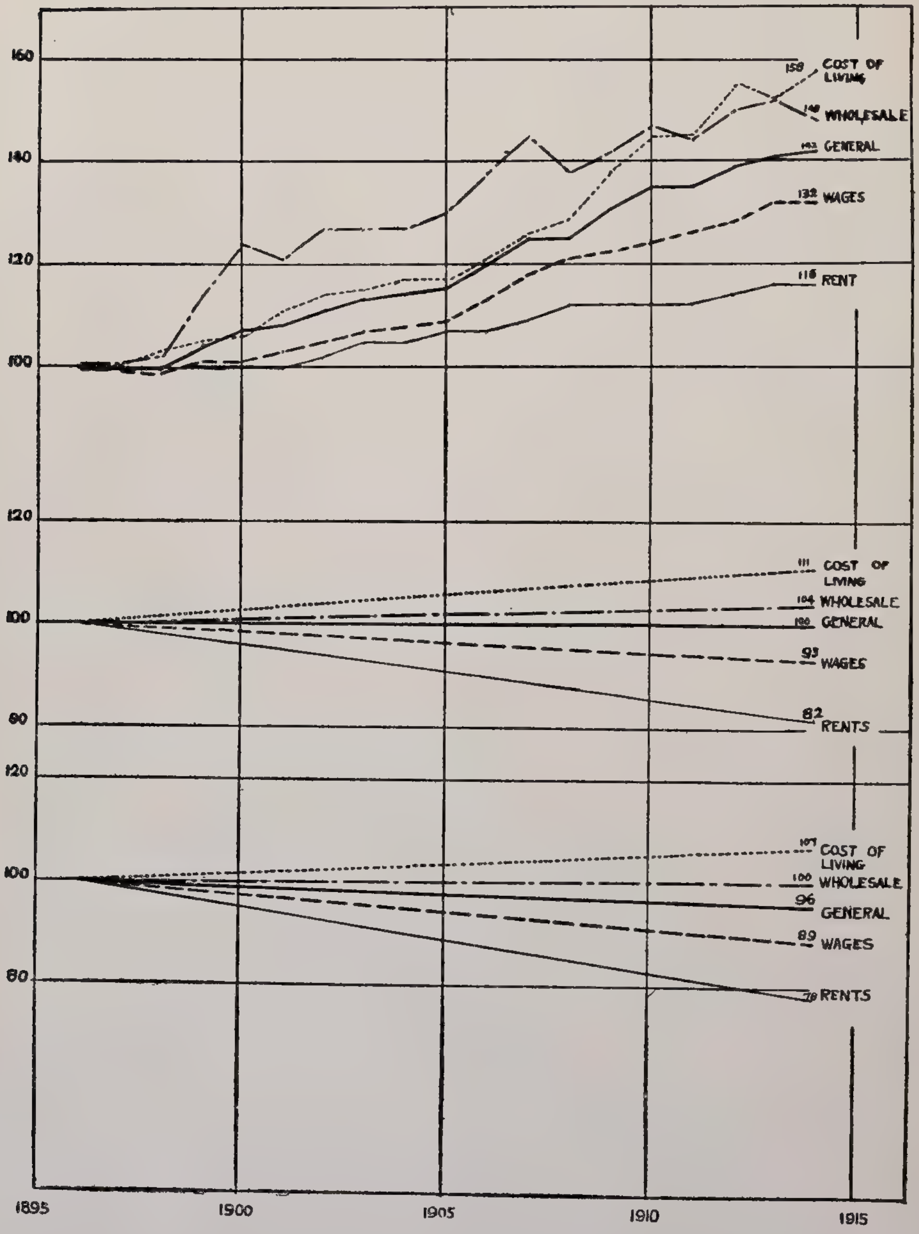
CHART NO 32

LONG TIME MOVEMENTS, 1875-1896



lines, without plotting the intervening yearly indexes. According to this showing, a stable general price level from 1875 to

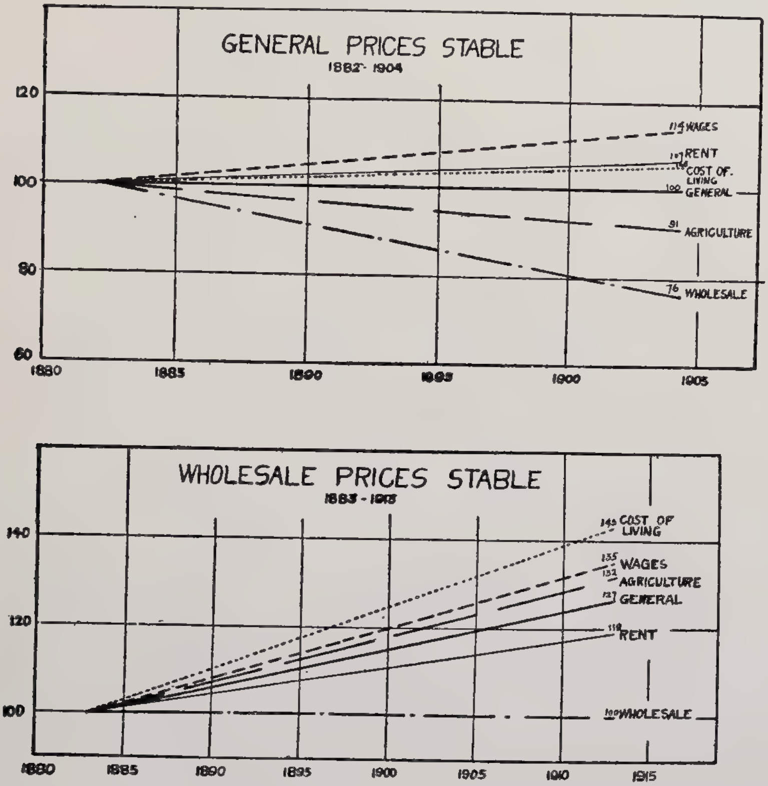
CHART NO 33
LONG TIME MOVEMENTS, 1896 - 1914



1896 would have been accompanied by a 32-per-cent decline in cost of living and a 29-per-cent rise of wages.

The bottom portion of the chart shows the differentials as they might have existed in 1896 if wholesale prices had been stabilized throughout the period. According to this showing, the cost of living would have risen 40 per cent and wages 90 per cent. The reader should bear in mind that the differentials shown in the bottom portion of the chart are the same percentage deviations from the wholesale index as those shown in the top portion, but that in the bottom series, they are expressed relative to a constant wholesale index of 100.

CHART NO 34
LONG TIME MOVEMENTS, ONE INDEX CONSTANT



Apparently any attempt at stabilization of prices during this period, whether of general, wholesale, or cost-of-living indexes, would have encountered extreme dispersion and instability among the various groups of prices.

Chart number 33 presents a similar analysis of price trends from 1896 to 1914, when the secular trend was upward. All groups participated in the rise, but to unequal degrees. All indexes have been adjusted to 1896 as a base of 100. The middle portion of the chart shows the distribution of differentials in

1896, assuming a constant general price level. Two indexes, namely, cost-of-living and wholesale prices, show a moderate rise; two other indexes, namely, wages and rents, show a moderate fall. The bottom portion of the chart carries out the comparison on the assumption that wholesale prices had been stabilized. Only one index rises, whereas three fall. The spread of the different groups is not as great as it was in the preceding period from 1875 to 1896. Nevertheless, it is obvious that stabilization of any index would have left room during this period for cumulative differentials among all the others. Stabilizing one index would have failed to stabilize all.

It may be objected that the method of shifting differentials on the hypothesis that general prices or wholesale prices had been constant involves unsound assumptions. It assumes that the differentials would have been the same under stabilization as under fluctuation. The writer admits that this assumption may be misleading and therefore does not argue that the middle and lower portions of the two charts are exact pictures of what would have taken place under the hypothetical conditions stated. Nevertheless, it is very doubtful whether the error from this source is serious.

As a partial vindication of the method, we may examine the scatter of prices between two dates when the general price index was actually constant. This condition is fulfilled by selection of the period beginning with 1882 and ending with 1904. The general index was the same in the latter year as in the former. The upper portion of the accompanying chart shows the scatter of prices when all indexes are adjusted to 1882 as a base of 100. Wholesale prices show a fall of 24 per cent, whereas wages show a rise of 14 per cent. In spite of a uniform general price level at the beginning and end of the period, a wide dispersion of price groups developed. The lower portion of the same chart carries out a similar scheme of comparison by selecting dates, namely 1883 and 1913, when wholesale prices were at the same level. All other indexes are adjusted to 1883 as a base of 100. Although wholesale prices are no higher at the end of the period than at the beginning, general prices are 27 per cent higher, agricultural prices at wholesale are 32 per cent higher, and cost of living is 43 per cent higher.

From these comparisons, we are brought to the inference that stabilization of any one index or of an average of all indexes is bound to leave room for wide dispersion of the individual groups. When stable wholesale prices can be accompanied by a 43-per-cent increase in the cost of living, we must admit the limitations of any stabilizing program. It is exceedingly doubtful whether we can stabilize wholesale indexes and the cost of living at the same time. Whichever index is stabilized, the other is likely to run off at an angle. If we stabilize wholesale prices, the cost of living is likely to rise. This probability is borne out consistently by the results of study of each of the three periods, 1875-1896, 1896-1900, 1883-1913. With wholesale prices constant, the rise of the cost of living for these respective periods is estimated at 40, 7, and 43 per cent respectively.

On the other hand, if we stabilize the cost of living, wholesale prices are likely to fall. In the period 1882 to 1904, when the cost of living was nearly stable, wholesale prices fell 24 per cent. If we stabilize general prices, we get substantially the same result as when we stabilize the cost of living.[1] Faced with the various price groups, we clearly can not stabilize them all.

The critical reader will entertain doubts as to the adequacy of many index numbers to measure the items they purport to measure. The old Bureau of Labor wholesale index gave an average of 272 for May, 1920 (1913 = 100), whereas the new and revised index cut this down to 247. Snyder's former composite index for March, 1926, was 186, whereas the revised index for the same date was only 171. The cost-of-living index prior to 1910 was based on food alone. The cost-of-living index prepared by the Bureau of Labor Statistics was 175 for June, 1926, whereas that prepared by the Massachusetts Wage Commission was only 159 for the same date. Wholesale indexes overemphasize raw materials and semifabricated products and underemphasize highly fabricated products. The last-mentioned group of products contain a relatively heavy element of labor cost, yet are used sparsely in wholesale averages. Their omission is due largely to the fact that they consist of articles of style, taste and fashion which cannot be reduced to standardized units. The effect of their omission is to underestimate the wholesale price level when labor costs are rising. This discrepancy is reflected in the gap between current wholesale indexes and cost-of-living indexes. Thus, the Bureau of Labor wholesale index for June, 1926, was only 152, whereas its cost-of-living index was 175. This divergence of 23 points doubtless exaggerates the real spread between the two price groups since 1913. It does so in large part because of limitations in the methods of constructing the index numbers. If the wholesale index included a due proportion of highly fabricated products, much of this spread would disappear. Obviously, the shortcomings of our index numbers place serious limitations upon a program to stabilize any given index number. However, by no means can all of the spread of prices be attributed to the imperfections of index numbers. The balance is traceable to two major sources. (a) First, there is a certain amount of readjustment inevitable in a dynamic money economy. This normal degree of dispersion is normal and ineradicable. It will exist under a stable money unit as well as under a fluctuating unit. (b) Second, there is a certain amount of price dispersion generated by radical changes in the trend of prices. Inflation and deflation alike tend to create an abnormal scatter of prices. A stabilization program strikes at the latter source alone. It should be expected to reduce somewhat the excessive internal scatter and realignment of prices, but not to eliminate it altogether.

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[1] The period 1896 to 1914 offers a mild exception to this general statement. The shift in relationship of wholesale prices and cost of living between 1910 and 1914 should be noted.

The foregoing discussion applies mainly to the secular trend of prices. However, the cyclical movement may be traced on charts number 32 and 33. The top portions of these charts show short-time movements interwoven with long-time trends. Both the cost-of-living index and the general index show relatively slight cyclical variation. As Carl Snyder has observed, "The general price level shows a very slight cyclical movement. One of the most sensitive general indexes of prices is the Department of Labor wholesale price index. This index shows a decided cyclical movement." [1]

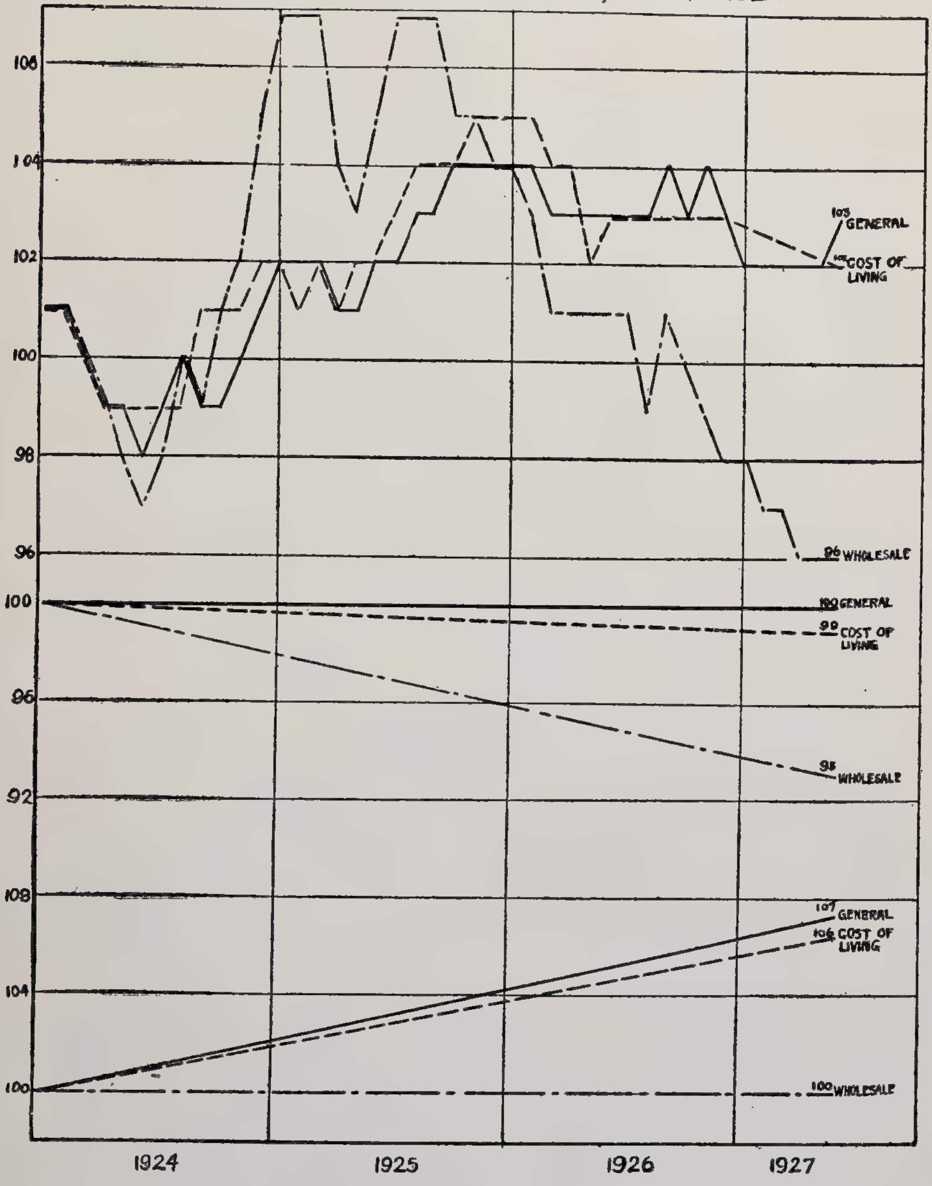
A more intensive account of these relative cyclical movements is afforded by the accompanying chart of short-time movements from 1924 to 1927. Monthly indexes have been adjusted to 1924 as a base of 100. Wholesale prices show a much earlier date of cyclical movement than the other series and a much greater amplitude of movement. The differentials between price

[1] *Business Cycles and Business Measurements,* 1927, p. 196.

groups at the middle of 1927 are shown in the middle and lower portions of the chart. These differentials are the same percentage differences as those shown in the top chart, but these

CHART NO 35

SHORT TIME MOVEMENTS, 1924-1927



differences are expressed, first, relative to an assumed constant general index of 100, and, second, relative to an assumed constant wholesale index of 100. When general prices are constant the cost of living moves very closely with them, but wholesale prices drop sharply. When wholesale prices are constant, the cost-of-living and general indexes rise sharply. Within a period of 3½ years, the scatter of these various indexes becomes surprisingly wide. Again, it may be emphasized that to stabilize one index is to fall far short of stabilizing all. Moreover, the inference which grows out of this evidence is that the wholesale index is the only index which affords a guide to control of prices in the business cycle. The other indexes move too late and too imperceptibly to be of much aid in cyclical control.

After this chronicle of difficulties in selection of an index number for stabilization, the reader may hold the impression that the difficulties are insuperable. This impression is correct if a counsel of perfection is required. However, the impression is not correct if merely a relative gain is required. Stabilization of either wholesale, cost-of-living, or general prices would be a definite improvement over no stabilization at all. But too much should not be expected of even the best stabilization program. The sum and substance of the whole matter is that control of prices may offer a distinct relative advantage over noncontrol, but that whatever index may be selected for control, other indexes must be expected to develop a wide degree of dispersion in both long- and short-time movements.

Out of this discussion, certain positive inferences arise. There are two conditions in which wholesale indexes are definitely to be preferred to general or cost-of-living indexes. (a) First, in stabilization by international agreement, wholesale prices alone are sensitive to the international connections of prices. A general index contains so many elements of purely domestic concern that international comparisons of such indexes would have little or no significance. It is in wholesale markets that international comparisons have to be made. It is in such markets that adverse or favorable balances of payment are primarily originated, gold flows induced, and international readjustments consummated. (b) Second, in control of prices in the business cycle, wholesale prices alone move early enough and sharply enough to furnish a guide to credit policy. If an agency of control were following a general index, that index might remain fixed during a period when wholesale prices were fluctuating violently. Inflation and deflation in wholesale prices might run the gamut from acute speculative boom to acute depression and unemployment without any appreciable sign of these disturbances appearing in the general index. If cyclical control is to be effective at all, it must be guided by wholesale fluctuations.

There is one condition under which a general index is to be preferred to wholesale indexes. If a country were to break away from the complete gold standard to the extent of stabilizing internal prices and abandoning a fixed unit par of foreign exchange, the secular trend of prices could be stabilized by selecting the general index of prices. This would be tantamount to selecting the cost-of-living index, since, as the previous charts have shown, these two indexes move closely together. But even if these indexes were selected for control of the long-time trend, the wholesale index would still have to be relied upon as a guide to cyclical control. A combination of indexes, in which general prices or cost-of-living prices served as a guide to long-time control, and wholesale prices as a guide to short-time control might offer the best solution of the problem.

Chapter XXIII

CONTROL OF THE PRICE LEVEL

(Continued)

Devices of Control.—A wide variety of devices of control have been proposed from time to time. Six of these devices have here been singled out for discussion: (1) the tabular standard; (2) the compensated dollar; (3) control of gold production; (4) central bank policy; (5) a managed paper currency; (6) a gold exchange standard.

(1) *The Tabular Standard.*—It is possible to make contracts between creditors and debtors calling for repayment not of a fixed number of dollars but of a fixed sum of purchasing power. The principal sum would be held to a constant purchasing power by use of a table of index numbers of the general level of prices. Such contracts can be made without any enabling legislation; but some authorities have advocated that, as a means of drawing attention to the plan, a law should be passed specifically permitting tabular contracts. After people voluntarily acquired the custom of making contracts in this form, the government might pass a law declaring that all contracts should be settled on the tabular principle, unless the contract specifically stipulated the contrary. The proposal seeks to eliminate the injustice between debtor and creditor which now results from changes in the value of the unit of account. However, it encounters numerous obstacles. It would be difficult to establish any single index number which would be fair to all classes of debtors. It would be confusing to have some contracts made on a tabular standard while others were made on a specie standard. It would be unsatisfactory to allow the price fluctuations themselves to continue, as the tabular standard would, and to limit the effort at control to attempts to escape the evil effects of such fluctuations by shifting the number of dollars which creditors would be entitled to receive on maturity dates. Without going more at length into the analysis, we may dismiss the tabular standard as practical only within narrow limits and as unlikely to afford an adequate solution of the problem of unstable money.

(2) *The Compensated Dollar.*—According to a plan advocated by many earlier economic authorities but made familiar to the public chiefly through the efforts of Irving Fisher, the weight of the dollar would be increased 1 per cent per month until any rise of prices was corrected, and decreased 1 per cent until any fall of prices was corrected. The result would be a specie unit of unstable weight but of stable purchasing power. Fisher advocates the use of an index number of wholesale commodity prices as the guide to adjustments in the weight of the dollar. Gold coin would be withheld from circulation. Free coinage of gold would be terminated, and free, *i.e.,* unlimited, purchase and sale of gold bullion at the Mint or Treasury would be instituted. A decision to alter the weight of the dollar 1 per cent would be translated into action by changing the official selling and buying price of gold 1 per cent. If wholesale prices were to rise, the Mint would lower the buying and selling price of gold. At the lowered price, more gold would be consumed in the arts, bank reserves would be lessened, credit would be contracted, and wholesale prices would be lowered to par.

A brassage charge of 1 per cent would be imposed so that the official selling price would always be 1 per cent higher than the buying price. Since the increments of change in the weight of the dollar and in the buying and selling prices of gold would always be the same as the brassage fee, speculation in gold would be prevented. A speculator who anticipated a 1-per-cent rise in the buying price tomorrow could not go to the Mint today and buy gold to be resold at tomorrow's advance in price. He could not do so because today's official selling price, being above today's buying price by the brassage fee of 1 per cent, would just equal tomorrow's enhanced buying price. Fisher contends that speculation beyond one adjustment period would be averted by the expense and risk involved. Internationally, the gold standard would not be abandoned, but would be modified. The mint par would automatically change every time the weight of the dollar changed, since, by definition, the mint par is the ratio between the weight of the dollar and the weight of any other money unit. But a moving mint par would not mean an elimination of gold import and export points. The specie points would still regulate the short-time fluctuations of exchange rates, but they would be measured strictly with reference to the mint par existing at any given time. Thus, we should be linked with gold through the foreign exchanges, yet the internal value of our monetary unit would be constant and independent of world-wide changes in the purchasing power of that metal. Hence, one country could adopt the plan without waiting for an international agreement, although such an agreement would be the ultimate goal of sponsors of the plan.

The compensated dollar would probably be effective in stabilizing the secular trend of prices, but would be open to serious criticism as a regulator of the business cycle. This conclusion arises from the purely mechanical process which the plan involves. Not until a price advance is an accomplished fact does the mechanical increase in the weight of the dollar at the rate of 1 per cent per month take effect. Corrective action is delayed until inflation or deflation has materialized. It seeks to remedy a past rise or fall in prices but not to prevent a future rise or fall. There is no room for judgment and sagacity. The plan is absolutely automatic. Of course, this quality makes the plan immune from political tampering. It takes stabilization out of politics, and, as some have said, gives a fool-proof plan. But in order to achieve this automatic mechanism, the plan completely eliminates all room for financial statesmanship. It deprives the board of control of any power to anticipate the movements of prices, to take action in advance of the major oscillations of the business cycle, to apply the weapons of control in those incipient stages of the cycle when inflation and deflation are in the making.

Even if it be granted that the plan is economically sound so far as the secular trend of prices is concerned, there remains a serious obstacle to introduction of the plan. At two points it introduces uncertainty where certainty is deeply imbedded in the conscious usage of the public. First, it destroys the certainty that the creditor will receive an amount of gold equal to that which he loaned. The amount which he will receive will vary according to some abstract index number which may measure purchasing power in general, but may miss by a wide margin measuring the individual creditor's purchasing power in a local market. Second, the plan destroys the certainty of a fixed mint par in foreign exchange. Over against this loss of certainty, Fisher promises the new certainty that a dollar will always have the same purchasing power as measured by some abstract index number. As a purely economic proposition, the new certainty of a dollar of stable value is much to be preferred to the old certainty of a fixed weight and fixed unit par of exchange. But as a proposition in political science, the new certainty does not counterbalance the old. As a form of social control, the new certainty asks a great deal in the form of a surrender of old safeguards and presumes a great deal in the form of a popular comprehension of statistical technique. To the mathematical economist, the public is as abstract as an algebraic equation, but to the political scientist, the public is a psychological group, a crowd electorate, a social phenomenon. Consequently, however great the scientific merits of the compensated dollar, there are tremendous, if not insuperable, obstacles to its adoption.

(3) *Control of Gold Production.*—Some students of price control have advocated international regulation of the output of the gold mines. The great bulk of the gold output of the world is derived from the British Empire, Russia, Mexico, and the United States. These four countries have a virtual monopoly of the gold resources of the world. If their governments were to agree to restrict output and allocate quotas of production, they could prevent excessive production of gold and secular inflation of prices such as that which occurred from 1896 to 1914. However, if shortage of production were imminent, due to exhaustion of mines, such international action would be of little value. Governments might then subsidize the mines as an incentive to sustained production, but this would only hasten the day of ultimate exhaustion of gold-bearing ores. The plan would be effective only as a preventive of overproduction of gold. Even for that purpose the plan encounters the grave difficulties of obtaining an international agreement. Gold valorization by joint action of foreign offices, departments of state, congresses and parliaments, is a project of doubtful promise.

(4) *Central Bank Policy.*—In this case the proposal is that the central bank, by manipulation of the discount rate and by proper supplementary policies, should undertake to control the price level. The proposal will be discussed under three heads:

(a) The devices of control
(b) The criteria of action
(c) The limits of control

(a) THE DEVICES OF CONTROL.—The chief device of control is the discount rate of the central bank. This rate, it is proposed, should be raised to prevent prices from rising excessively during booms and lowered to prevent prices from falling excessively during depressions. An advance in the discount rate would aim to restrict the volume of borrowing during a wave of business expansion. This restriction would curtail the means of payment and so curtail the ability of traders and of the public to bid up the prices of goods. A reduction in the discount rate would aim to stimulate the volume of borrowing during a wave of receding business. This stimulus would augment the means of payment and so sustain the ability of the public to bid for goods.

Such manipulation of the discount rate requires various supplementary devices if the official rate is to be made effective. The rate charged by the central bank does not impose any burden upon the member banks unless the member banks are seeking accommodation at the central reservoir. This they are likely to be doing when a business boom is under way. The member banks extend credit to the extent of their resources. In order to secure extraordinary funds for their customers they must, at a certain stage of the cycle, resort to borrowing at the central bank. If they are charged, let us say, 6 per cent instead of 4 per cent, they will minimize their borrowings to discourage their own customers from asking for additional credits, and will impose higher rates upon customers who actually require more funds. But it will often happen that the central bank will desire to advance the rate before the member banks of their own volition seek emergency accommodation at the central institution. In that event, the central bank must resort to special devices to make its rate effective. The primary devices will be moral suasion and open-market transactions.

Moral suasion implies an attempt to warn the banking fraternity that inflation has gone far enough, and to secure their coöperation in restricting credit expansion. Central bank officials, by public statements and by personal conferences, may engender an attitude of caution and conservatism throughout the community. In fact, the mere act of raising the rate is likely to be interpreted by the public as a danger signal. It automatically has a certain psychological effect upon both bankers and business men and creates a spirit of hesitation and retrenchment. Conversely, the lowering of the discount rate may come as a signal for release of business, for revival of industry, for recovery from depression.

However, these psychological reactions are somewhat uncertain, and a more drastic and positive weapon for making the discount rate effective is necessary. This weapon is found in open-market policy. When the discount rate is advanced, the central bank may sell some of its holdings of commercial assets or of securities in the open market. This action will take money out of the market and will, therefore, tend to tighten the market. Member banks, in order to fill the money gap created by these open-market transactions, will find it necessary to borrow from the central bank. In the United States, they will borrow directly from the Federal Reserve Banks. Having been forced to come to the central bank, they will be confronted with the advanced discount rate established by that institution. The burden of a higher discount rate will have a sobering effect upon their commitments and will tend toward damping down their liberality of accommodation to customers. On the converse side, if they wish to make a lowered discount rate effective, they may purchase bills and securities in the open market and so flood the market with new funds. The result will be easy money, lowered rates, and greater liberality of accommodation to customers.

The plan as outlined exhibits the characteristics of a simple orderly mechanism. The discount rate of the central bank is the primary device of control and is made effective by moral suasion and open-market policy. But this impression greatly oversimplifies the problems involved. The plan does not operate in a mechanical routine but requires constant administrative guidance. Its success depends upon the discrimination and judgment of central bank officials in analyzing complex situations of finance and trade. The criteria and guides of such policy formation may next be considered.

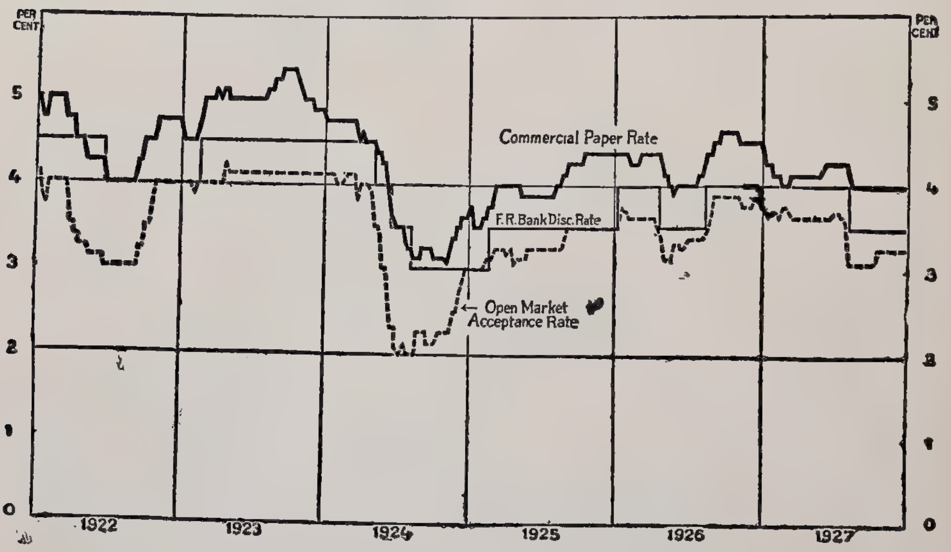
(b) THE CRITERIA OF ACTION.—The objective of price control having been adopted, the central banks would face the necessity of answering such questions as in what direction to take action, when to take action, and how drastic action to take. This necessity is forcefully stated by A. C. Miller of the Federal Reserve Board:

> Assuming that we want price stability, in order to obtain it we have to look at things closer to the source or beginning of troubles than the

price index. If you are to have competent control of credit you cannot wait until inflationary developments register themselves in the price index. By that time the thing will have already gotten considerable momentum. Restraint on inflation really requires a degree of foresight and requires other methods of testing what is in course of development than the price index. The price index looks backward.[1]

CHART NO 36

MONEY RATES IN NEW YORK CITY



One of the "other methods of testing" is comparison of the central bank rate with open-market rates. Chart number 36 indicates the relationship which the New York Federal Reserve Bank rate bore from 1922 to 1927 to rates on commercial paper and on bank acceptances. The discount rate consistently held a position above the acceptance rate. This relationship corresponds with the rule established in England and some other countries that the official rate should be above the open-market rate. This rule is intended to confine borrowing from the central bank to emergency requirements. Private banks cannot borrow from the central bank and relend the funds in the open market at a profit. Our acceptance rate corresponds with the English rate on open-market bills. Our commercial paper rate, on the other hand, finds no analogy in the English money market. It is the rate on single-name commercial paper,—a form of credit instrument peculiar to the United States. It is not eligible for purchase by Federal Reserve Banks, is not as safe as the bank acceptances, and bears an interest rate from one-half to 1 per cent higher than that of the bank acceptance. By experimentation, the Federal Reserve Banks have found that the official rate may ordinarily be kept slightly below this commercial paper rate. This practice also means that the official rate is considerably below the customers' rate.

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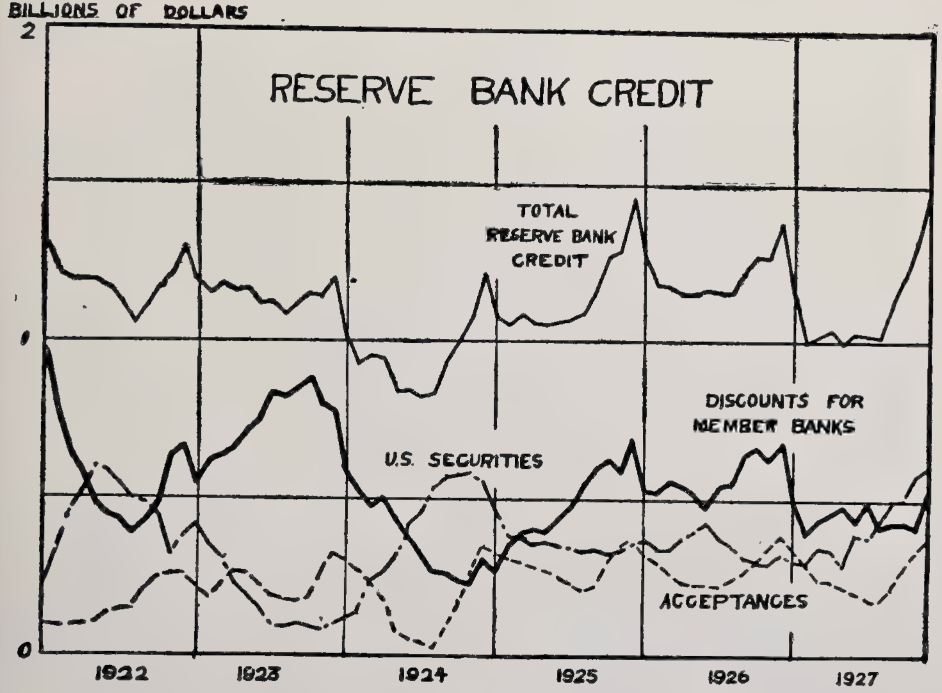
[1] *Hearings on the Strong Bill*, 1926–1927, Committee on Banking and Currency of the House of Representatives.

CHART NO 37



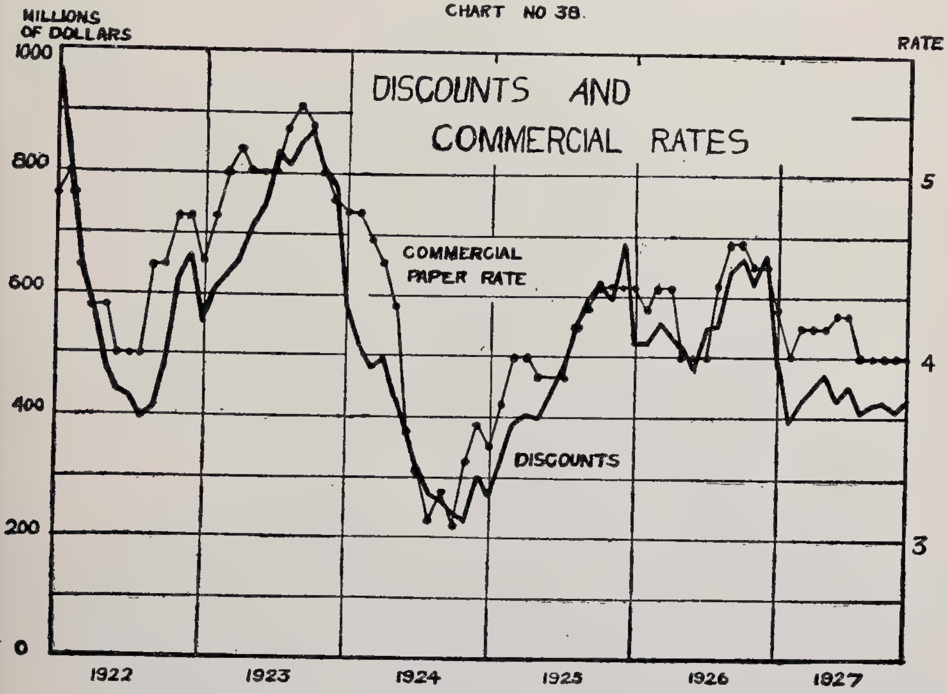
It may be wondered why member banks do not borrow from the Reserve Banks in order to relend at the higher rates obtainable on commercial paper and commercial loans. The answer is that an unwritten rule or code has grown up to the effect that it is a sign of weakness for a member bank to be continuously in debt to a Reserve Bank. As long as this tradition against permanent use of Reserve Bank credit remains in force, it is unnecessary to place the official rate above the commercial paper rate or customers' loan rate. If the commercial rate and acceptance rate show a tendency to rise, the Reserve Banks may raise the official rate in order to keep it in line with the open-market rates. This policy, however, would often mean belated action. Interest rates proverbially lag in the business cycle, and price movements may be well under way before open-market rates give the signal. Hence, it would be necessary for Reserve Banks to lead rather than follow the market if they were to adopt a definite policy of price control. This they did, for instance, in 1924, as shown by the accompanying chart. By leading the market they may within certain limits control the market. A policy of price stabilization would require an official rate which anticipated somewhat the open-market rates and which to a substantial degree drew them into line with central bank policies of tightening or easing the markets.

A further "method of testing" is analysis of the volume of credit. This analysis extends to both member banks and Federal Reserve Banks. Country banks furnish reports monthly, and city banks weekly, on volume of loans, investments and deposits. Any tendency of such credit items to increase at a rate faster than a normal trend of growth, is viewed with suspicion as an inflationary movement. Federal Reserve Banks prepare weekly reports on volume of discounts, bills bought in the open market and United States securities owned. The fluctuations in these items and in the total of Reserve Bank credit are shown in chart number 37. An abnormal increase in Reserve Bank credit is often interpreted as indicating an abnormal expansion of member bank credit.

Quality as well as quantity of credit is a significant guide to central bank policy. The quality of member bank credit is shown by reports on brokers' loans, loans on securities, commercial loans, and investments. From such data, bank officials can ascertain whether credit is being drawn off into stock market or real estate transactions, or is being used in meeting the legitimate needs of commerce. Moreover, Reserve Banks are in direct contact with member banks by personal conference and bank examinations and are, therefore, able to ascertain any shift in the quality of member bank resources. The composition of Federal Reserve Bank credit varies widely from time to time. A sale of securities owned often drives member banks to rediscount an approximately equal amount of paper, with the result that the total of Reserve Bank credit remains practically unchanged. However, the shift in quality of such assets bears an important relationship to conditions in the money market. When member banks have to go into debt to the Reserve Banks by rediscounting, they encounter the tradition that continuous rediscounting is a sign of weakness. In order to get out of such debt as soon as possible, they call some outstanding loans and advance somewhat the rates on new loans. This close relationship between rates and volume of discounts is indicated by chart number 38.

The curve of discounts reflects the credit voluntarily demanded by member banks. At the existing discount rate, the member banks decide how much they shall discount at the Reserve Banks. In a similar manner, the initiative is theirs in deciding the volume of bankers' acceptances that will be sold to the Reserve Banks in the open market. The Reserve Banks stand ready to buy all acceptances offered at the rate officially established. However, the volume of securities owned is determined solely by the Reserve Banks. Fluctuations in this item reflect a deliberate official policy to inject money into the market or draw money out of it. Thus, discounts and bills bought may be classified as voluntary credits from the standpoint of member banks, whereas securities owned may be classified as involuntary credits from their standpoint. A decided increase in voluntary credits is usually a signal for careful scrutiny of member bank expansion.

CHART NO 38.



A further "method of testing," to use again the phrase quoted from A. C. Miller, is analysis of reserve ratios and gold movements. This form of analysis, as it had been perfected in pre-War England, was described as follows by the Cunliffe Committee of 1918:

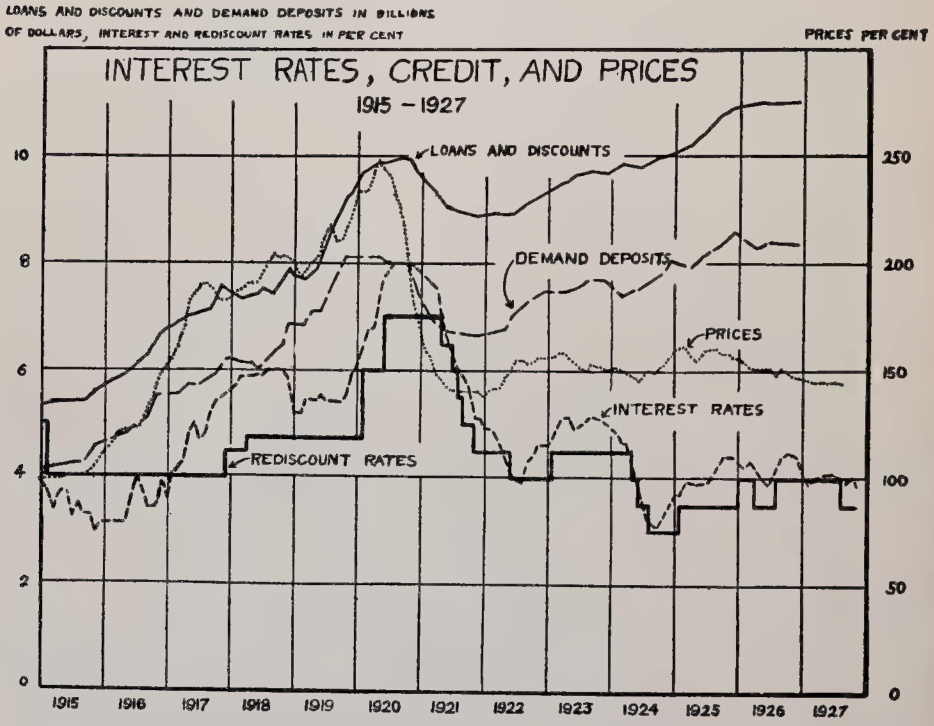
> When the exchanges were favorable, gold flowed freely into this country and an increase of legal tender money accompanied the development of trade. When the balance of trade was unfavorable and the exchanges were adverse, it became profitable to export gold. The would-be exporter bought his gold from the Bank of England and paid for it by a cheque on his account. The Bank obtained the gold from the Issue Department in exchange for notes taken out of its banking reserve, with the result that its liabilities to depositors and its banking reserve were reduced by an equal amount, and the ratio of reserve to liabilities consequently fell. If the process was repeated sufficiently often to reduce the ratio in a degree considered dangerous, the Bank raised its rate of discount. The raising of the discount rate had the immediate effect of retaining money here which would otherwise have been remitted abroad and of attracting remittances from abroad to take advantage of the higher rate, thus checking the outflow of gold and even reversing the stream.
>
> If the adverse condition of the exchanges was due not merely to seasonal fluctuations, but to circumstances tending to create a permanently adverse trade balance, it is obvious that the procedure above described would not have been sufficient. It would have resulted in the creation of a volume of short-dated indebtedness to foreign countries which would have been in the end disastrous to our credit and the position of London as the financial center of the world. But the raising of the Bank's discount rate and the steps taken to make it effective in the market necessarily led to a general rise of interest rates and a restriction of credit. New enterprises were therefore postponed and the demand for constructional materials and other capital goods was lessened. The consequent slackening of employment also diminished the demand for consumable goods, while holders of stocks of commodities carried largely with borrowed money, being confronted with an increase of interest charges, if not with actual difficulty in renewing loans, and with the prospect of falling prices, tended to press their goods on a weak market. The result was a decline in general prices in the home market which, by checking imports and stimulating exports, corrected the adverse trade balance which was the primary cause of the difficulty.
>
> When apart from a foreign drain of gold, credit at home threatened

to become unduly expanded, the old currency system tended to restrain the expansion and to prevent the consequent rise in domestic prices which ultimately causes such a drain. The expansion of credit, by forcing up prices, involved an increased demand for legal tender currency both from the banks in order to maintain their normal proportion of cash to liabilities and from the general public for the payment of wages and for retail transactions. In this case also the demand for such currency fell upon the reserve of the Bank of England, and the Bank was thereupon obliged to raise its rate of discount in order to prevent the fall in the proportion of that reserve to its liabilities. The same chain of consequences as we have just described followed, and speculative trade activity was similarly restrained. There was therefore an automatic machinery by which the volume of purchasing power in this country was continuously adjusted to world prices of commodities in general. Domestic prices were automatically regulated so as to prevent excessive imports; and the creation of banking credit was so controlled that banking could be safely permitted a freedom from State interference which would not have been possible under a less rigid currency system.

The exact conditions here described do not now exist, partly because gold is withdrawn from circulation in England, and partly because the gold stock of the world is distributed in somewhat abnormal proportion among the countries of the world. Nevertheless, making due allowance for these changes, we still find in reserve ratios and gold movements a most important guide to bank policy. Discount rates and securities owned in the Reserve Banks of the United States have been gauged to meet the readjustments involved in unusual imports and exports of gold. Informal coöperation between leading central banks of the world has come into vogue as a means of controlling international gold movements.

However, reserve ratios and gold movements are defective as guides to a price stabilization policy in that they do not give the warning early enough. They are the results of maladjustment, whereas proper criteria of action should be forecasters of maladjustment. In this defect, gold indicators resemble most of the financial indicators already discussed,—open-market rates, volume of credit and quality of credit. This conclusion may be illustrated by chart number 39. Loans and discounts and demand deposits of National banks outside New York City do not consistently and decisively precede price movements and cannot be relied upon in any automatic way to forecast price movements. Interest rates, *i.e.,* rates on 60-90 day commercial paper, show a disposition to lag behind price movements as measured by the wholesale index of the Bureau of Labor Statistics. Except in 1924, rediscount rates have tended to follow rather than to lead commercial rates. All of these monetary barometers are useful, but all are open to the defect that they do not tell the story early enough to enable a central bank to anticipate major price movements. In order to size up movements in their incipiency, it is necessary to go direct to the business situation.

CHART NO 39



Business analysis as a "method of testing" leads into a careful study of the physical and psychological elements of the whole economic order. Volume of production, of employment, of stocks of goods on hand, of consumption—must be examined with a view to discovering the basic processes of the industrial and trade cycle. Commitments, orders, cancellations, are among the earliest omens of forthcoming adjustments all along the line. They reflect the changing expectations of business men, the shifts from optimism to pessimism, the reactions from hand-to-mouth buying to forward buying, the underlying plans and purposes of the business community. Central banks would need to know whether additional credit was likely to be used to speculate in commodity inventories or to meet current physical needs for merchandise. If employment and production were at capacity, they would infer that additional credit would be likely to inflate prices rather than to increase output. If consumption were falling behind production, they would infer that a period of liquidation was imminent. To analyze factors of this type is to apply price control at the source. Obviously, such analysis depends upon judgment and personal opinion. No mechanical indicators can be followed blindly. Financial statesmanship of a high order is the cardinal requirement.

(c) The Limits of Control.—Even on the assumption that the criteria of action are adequate and workable, the plan of central bank control encounters definite limitations. One such limitation arises from the very nature of the gold standard. Gold reserves are restricted by the rate of output of the mines. If a shortage of gold occurs, a lowering of the discount rate cannot arbitrarily sustain the long-time trend of prices.[1]

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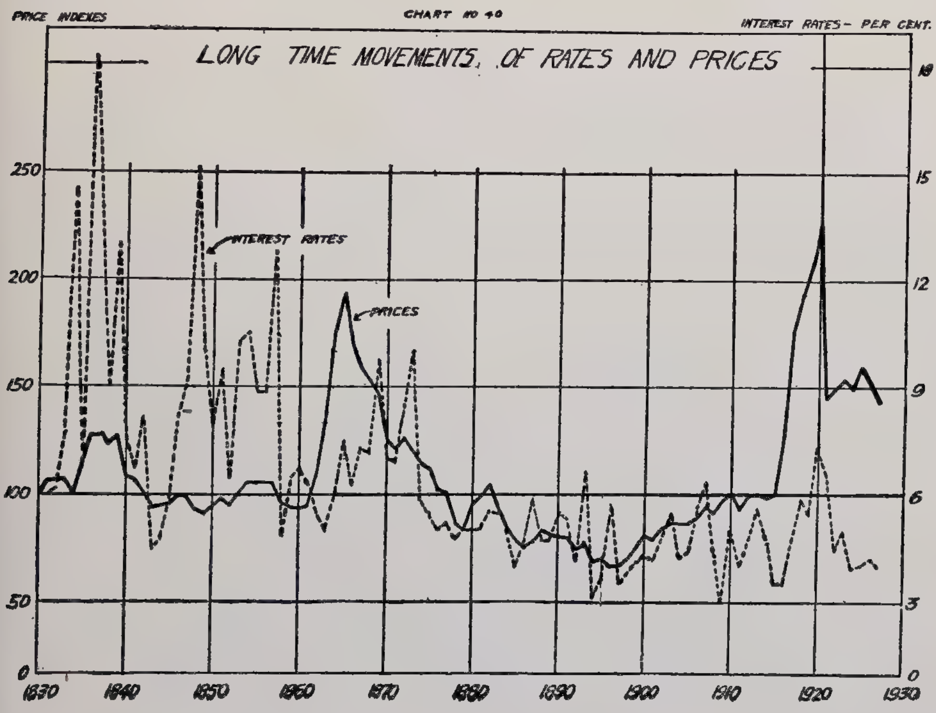
[1] The accompanying chart compares the long- and short-time movements of prices and interest rates in the United States over a period of nearly a century.



The banks cannot extend their deposit liabilities beyond a certain proportion, fixed by law or custom, to their specie reserves. To do so would be to approach an insolvent condition. Conversely, if an excess of gold is thrown on the market, primary expansion of credit will tend to be realized in the course of time, no matter what the discount rate may be. To adhere to the gold standard in its present form is to preclude the possibility of stabilizing the secular trend of prices by central bank discount rate policy. It is to confine the efficacy of such policy to short-time or cyclical movements.

If the gold standard were to be abandoned and an inconvertible paper standard adopted, the possibility of secular trend stability of prices would be enhanced. A growing body of economic authority inclines to the view that under a free-paper standard, a reduction of the discount rate would tend to stimulate borrowing, to inject funds into circulation, and to sustain the price level at any desired point. Conversely, according to this view, an advance of the discount rate would check any inflationary tendency of prices. The secular trend as well as the cyclical waves would come under control because cash reserves, *i.e.*, legal tender notes, would be entirely adaptable to any requirements placed upon them. Volume of reserves would no longer be at the mercy of the gold mines but would be governed by the growth requirements of the country.

In criticism of this theory, many economists have said that the bank rate cannot arbitrarily be placed out of line with the so-called "real" rate. By the "real" rate is meant the rate on long-time capital as determined by supply and demand of capital, marginal productivity, time-preference, or such other factors as a particular theory claims to be the determinant of the real rate. In answer to this criticism, it may be pointed out that additional

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Prices are measured by wholesale indexes as estimated by J. P. Young, *European Currency and Finance*, 1925, p. 436. Interest rates are measured by average rates on 60–90 day commercial paper as estimated by F. R. MacAuley in unpublished studies. Prior to the Civil War period, no definite long-time relations between interest and prices are discernible. However, from that point to the World War period, the tendency for the two series to rise together and to fall together is apparent. The short-time peaks and valleys correspond with booms and slumps of business activity. Interest rates show a greater short-time amplitude of fluctuation than prices, but a lesser long-time amplitude. It is obvious that interest rates lacked the power to preserve either secular or cyclical stability of the price level.

credits induced by lowered bank rates themselves constitute a readjustment in the supply of capital. Such credits enable the borrower to purchase instruments of production. They give him command of real capital. They are in effect a forced capital levy upon the community.[1] By extending additional loans to business men, the banks make a forced requisition from the public of real capital and so induce a fall in the real rate of interest. The real rate is, therefore, to a material degree subject to control by the bank rate. The real rate, instead of acting as an iron law dictating what the bank rate must be, is susceptible of a definite measure of influence by the bank rate.[2]

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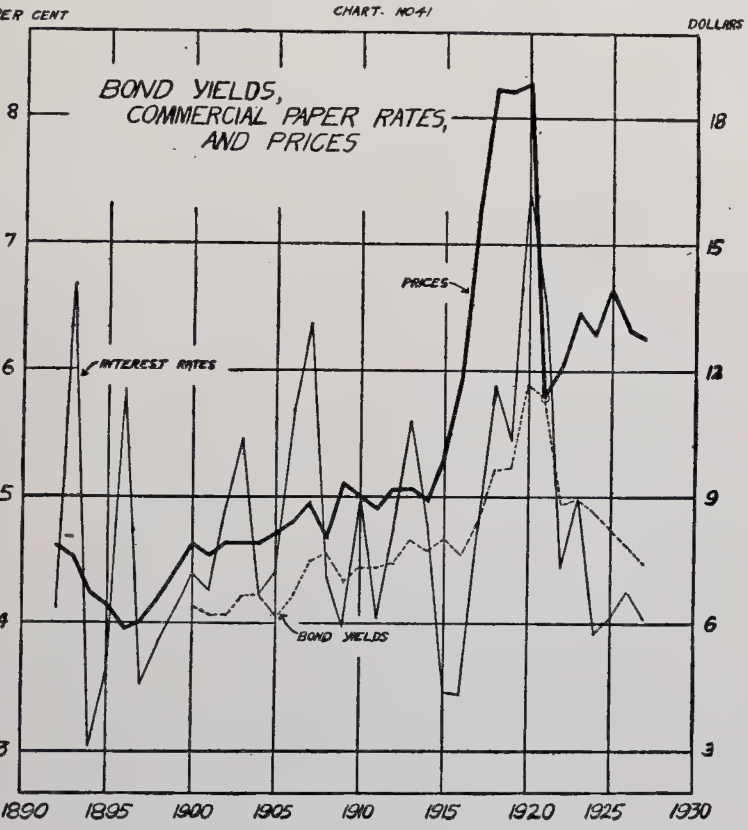
[1] For an amplification of this doctrine, see PIGOU, A. C., *Industrial Fluctuations*, 1927, part I, chs. XIII, XIV; part II, chs. VI.

[2] The accompanying chart compares interest rates on 60–90 day commercial paper, yields on sixty high-grade bonds (Standard Statistics Company), and Bradstreet's annual indexes of wholesale prices. The advance of bond yields from 1900 to 1915 parallels closely the advance of prices. The violence of cyclical movements of commercial rates makes their long-time movements difficult to trace. The possibility of rather wide deviations of commercial rates from bond yields and of the persistence of such deviations over a period of years is obvious.



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Let us assume that under a free-paper standard the price level is raised 10 per cent by a deliberate reduction of the bank rate. Once the new price level has been attained, it will tend to persist without the aid of an abnormally low rate. The bank rate can then be raised to the level that would have prevailed on the old price scale without fear that the price level will drop back to its old index. A permanent new price level has now been established and, after the transition period, it can be maintained without an artificially low bank rate. The logical outcome of this reasoning is that we may define the proper bank rate under a free-paper standard as that rate which increases the means of payment just fast enough to meet the requirements of the growth of business at a stable price level. We should be careful to reëmphasize that this proposition applies only to a free-paper standard. It does not apply to the gold standard in its present form.

Another limitation of central bank control is the inelasticity of demand for bank credit at certain phases of the business cycle. This inelasticity appears, for instance, in the boom period. An advance of the bank rate from 4 per cent to 6 per cent may lead to no curtailmant of demand. Borrowers may be so confident of prosperity and high profits that they will progressively increase their borrowing in spite of higher interest rates.[1] There are two remedies for this situation. One is to raise the rate early enough to check the expansion before it becomes so relentless. Timeliness of action, anticipation of the speculative furor, rate control before the inflation becomes acute, would go far to make central bank policy effective. The other remedy is to put the rate up to extraordinary heights and supplement it with a bold open-market policy until the overconfidence of the business community is shaken and the obstinate demand for funds is broken. Unfortunately, if the inflation is allowed to go to this extreme before bank policy is asserted, the reaction is likely to be a precipitate and violent deflation.

The most baffling form of inelasticity of demand for bank credit occurs in the early depression phase of the business cycle. Confronted with a drastic slump of trade, business men refuse to borrow no matter how low the rate of interest may be dropped.

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[1] One reason for the failure of higher rates to curtail demand is the relatively small ratio of interest cost to total cost in most lines of business. See YOUNGMAN, ANNA, *American Economic Review*, vol. XI, 1921; also SNYDER, CARL, *ibid.*, vol. XV, 1925.

Of course it is inconceivable that the nominal rate should drop to a negative point, and yet any positive point may be futile as a stimulant to borrowing. On the down grade the hands of the bank are tied more narrowly than on the upgrade, since they cannot lower the rate below zero, but they can raise the rate as high as they please. Nevertheless, the dullness of demand in depression need not lead us to despair of central bank control. The clue to control is timely restriction of the preceding period of inflation. If early and decisive action is taken in the up-swing of the cycle, the subsequent down-swing is not likely to go to extremes. Thus the inelasticity of demand during depression need not greatly bother the central banks if they keep their hands firmly on the situation during the incipient stages of inflation. In stabilization, the military aphorism is applicable,—Time is everything.

A further form of limitation of control is the incompetency of political administration, the injection of partisan politics in bank regulation, and the misunderstanding by bankers as well as by the public of the technique of index numbers, price levels, discount rates and open-market transactions. We need not discuss these political problems since the present treatment is confined to economic investigation.

(5) *A Managed Paper Currency.*—The phrase, "managed currency," is widely familiar as the title of a plan sponsored by the English economist, J. M. Keynes.[1] This plan contains elements of the plans examined in the foregoing discussion, but in addition contains certain unique and original features. Its main characteristics may be briefly outlined as follows:

(a) Stability of internal prices would be adopted as the primary objective of control and stability of exchange rates would be sacrificed to this end. Prevention of cyclical unemployment and of injustice over short and long periods between debtors and creditors and between various income classes, would be the ultimate justification of the plan.

(b) An individual nation could adopt the plan without waiting for international agreement, although international coöperation would be eminently desirable.

(c) The internal price level would be controlled by regulation of the volume of credit and the price of credit, *i.e.,* the discount rate. The agents of control would be the central bank and the treasury. The former would adopt a discount rate and open-market policy calculated to raise or lower the country's means of payment in accord with the requirements of a stable price level. The latter would sanction methods of currency issue and would maintain a volume of floating debt suited to providing no more and no less cash and deposits than the central bank's policy of price control might call for. Fundamentally, the plan rests upon central bank control, and assumes a treasury policy not in conflict therewith.

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[1] *Monetary Reform,* 1923, chs. IV–V.

(d) Cash in the form of bank notes or government notes would be supplied in such quantities as might be called for by the amount of credit necessary to do business at the existing relatively stable price level. "The tendency of today is to watch and to control creation of credit and to let the creation of currency follow suit, rather than, as formerly, to watch and to control the creation of currency and to let the creation of credit follow suit." [1] The volume of currency would be a consequence of credit and price movements and would be separated entirely from the gold reserve. The prime criterion of note issue would be sufficient cash reserves to enable the banks to expand their deposit liabilities at a pace commensurate with the normal growth of commerce under a stable price level and to enable the public to hold a proportionate quantity of hand-to-hand currency.

(e) Circulation of gold coin would be suspended and compulsory acceptance by the Mint at a fixed price of all gold offered would be abandoned. Nevertheless, gold would not cease to play an important rôle. It would be an "ultimate safeguard and a reserve for sudden requirements." [2] Moreover, it would be useful in settling international balances of payments and in preventing sudden fluctuations of exchange rates. The influence upon exchange rates would be calculated to steady the day-to-day and the seasonal variations. Gold would not be calculated to prevent permanent deviations of such rates from the old mint par, since these would be natural and inevitable to the extent that internal prices differed from world prices of commodities. In order to prevent excessive short-time fluctuations of exchange rates, the central bank would have a buying and selling price of gold. This range of gold prices would keep the exchange rates steady within limits similar to those set by the specie points under

[1] *Keynes, op. cit.*, p. 200.

[2] *Ibid.*, p. 213.

a gold standard. If internal prices were held constant and world prices fell, the domestic exchange rate would tend to rise in proportion to the new discrepancy between internal and world prices. The central bank would then declare a new buying and selling price of gold which corresponded with the new level of exchange rates. Thus gold would permit relatively permanent movements of exchange rates but would prohibit those short-time fluctuations which are extremely disturbing to trade.

This elaborate program was outlined in 1923 before the tide had begun to shift decisively in the direction of a return to a gold standard not only in England but in other leading countries. Four years after the plan was broached, the world faced a condition in which stability of exchanges under a gold standard had definitely been resumed and stability of internal prices had been subordinated to that policy. Nevertheless, the doctrines of the "managed currency" school were not without influence. They are reflected in the widely accepted view that price stability as well as exchange stability should be striven for under the gold standard. They are reflected in the admission by central banks that control of the price level, although not the final test of discount and open-market policy, is one of the most important tests. Thus the gold standard has become more of a "managed standard" than it ever was before. However, if a world shortage of gold develops during the next decade or two, the narrow limits to price stability under the gold standard will become apparent. In that event the fall in the value of gold will again force the issue of price stability versus exchange stability.

(6) *The Gold Exchange Standard.*—The Genoa Conference of 1922 adopted a series of resolutions endorsing: (a) continuous coöperation among central banks of issue; (b) adoption of a fixed gold par of exchange by the several countries; (c) pooling of a large part of the gold reserves of all central banks in a few centers such as London and New York; (d) the acquisition of foreign reserves in the form of ear-marked gold, bank balances, bills, short-term securities, or other suitable liquid resources; (e) the use of resources at home and abroad to sustain the exchange rate within specie point range of a fixed par; (f) the regulation of credit by central banks "with a view of preventing undue fluctuations in the purchasing power of gold."

In substance, these endorsements of a gold exchange standard and a stabilized world price level require coöperation among leading central banks. They aim to secure both stability of exchange and stability of commodity prices. But they recognize that attainment of this aim requires international agreement. It is precisely at this point that the plan exhibits serious weakness. International agreement means a surrender of freedom of action of each nation. Pooling of reserves turns out to mean that other countries are expected to place most of their gold in the keeping of New York and London. This looks plausible from the side of New York and London, but suppose the proposition were reversed to read that New York and London should turn their gold over to Paris and Berlin. National interests would balk at such a preposterous scheme. Nationalism stands as a barrier to any form of gold disarmament by international compact. It is true that the Latin Monetary Union achieved a certain amount of internationalism, but the articles of agreement involved no surrender of control over the most worshipped element of a modern banking structure,—its specie reserve. And it is a tax on credulity to suppose a new American-European Monetary Union could be set up which would scrap domestic gold reserves and bury such reserves in the vaults of one or two alien centers. Even an Anglo-Saxon Monetary Union is difficult to imagine. Concerted action between London and New York is readily misconstrued as making one country the tool of the other. The most informal acts of coöperation have been followed in the United States by accusations to the effect that Uncle Sam is being hoodwinked by John Bull. Critics are not lacking to indict the Federal Reserve on the charge of sacrificing the interests of agriculture or of some other group in order to serve the interests of the British Empire. Under these conditions, the gold exchange standard, relying upon pooling of gold reserves and solidarity among central banks in credit policy, faces rather narrow limits of accomplishment as a means of price control.

Conclusion: A Positive Program of Control.—We have threaded our way through many plans of action and through many obstacles to their effective application. Yet the impression should not be gained that a program of control is unsound or impractical. Let us consider the possible framework of a program which may lay claim to being both expedient and pragmatic, yet which does not depart from safe and conservative principles of monetary economics.

Such a program recognizes certain limits of price control. Stabilization means not rigid, static fixation of the price level but moderation of cyclical inflation and deflation and relative stability of the secular trend of the price level. It takes general prices or cost-of-living as a guide to long-time price trends and wholesale prices as a guide to short-time trends and international comparisons. It admits the need for prediction of the future course of prices and for timeliness of action. It takes into account the international connections of prices under existing specie standards. It relies upon central bank control of discount rates, open-market transactions, and currency issue as primary instruments of control.

In its international aspects, such a plan does not contemplate an international agreement, formal or informal, nor does it contemplate an abandonment of the gold standard in its existing forms. Hence, it does not propose to sacrifice stability of exchange rates in order to attain stability of internal prices. Its claim to feasibility rests upon the presumption that price control should promise both stability of internal prices and stability of exchanges without formal agreement between nations and without rejection of the gold standard. All things considered—nationalism, politics, economic principles, public psychology, the grip of gold on the imagination of the world—the writer suggests that these requirements are the only lines of procedure which have a chance of acceptance in the proximate future. They are not offered as ideally the best economic plan or as an ultimate plan, but as a plan of accomplishment which fits in with existing institutions, existing bank judgment, and existing public opinion. It does not concede too much to things as they are and yet it does face squarely a condition as well as an aspiration.

One of the first tangible steps in such a program is a definite declaration of policy on the part of the United States. The present policy is highly ambiguous. The Federal Reserve Board has officially acknowledged the price level as one guide to discount policy, but only one among many. The Board and the Reserve Banks have not defined which index or indexes they are talking about, what they mean by stability, or whether they take into account secular trend as well as cyclical waves. They have opposed the Strong Bill which would definitely have committed them to "promoting a stable price level for commodities in general." In 1927 they disowned any responsibility for the drastic decline of commodity prices which had been under way since 1925. The net result is that the public has no way of knowing definitely how much price control is intended or when it is to be applied. A tangible and unequivocal statement of policy would therefore be an advance over the existing uncertainty of central bank policy.

Suppose a definite policy were announced. It would thenceforth guide the plans and commitments of business. We have seen how important are the expectations of the future course of prices in determining that course. If everyone expects prices to rise, that very attitude leads to aggressive buying, and boosting of prices. An expected rise generates a rise; an expected fall generates a fall. It follows that expected stability would in some measure tend to generate stability. Orders, plans and commitments made on the assumption of price stability would aid in making that stability effective.

But the effect of a definite declaration of price control on international expectations would be of equally great importance. The position of the United States in international finance is so strong as to enable that country to set the pace. Her large stock of gold and strong creditor position enable her to assume a leadership which would tend to bring other prominent countries into line. If England knew that the United States had definitely set her face in the direction of price stability, the financial authorities of England would be extremely unlikely to run at cross-purposes. Not only would their relative gold position make it inherently difficult to oppose price stability, but their state of mind is probably not unfriendly to the proposition of price stability on its merits. If England and the United States were to adopt the program along parallel lines but without any formal agreement, the pressure upon other countries to follow suit would be most persuasive. Thus, the value of the dollar would set the level for the world value of gold.

Eventually such a policy would be put to a crucial test by a world excess or shortage of gold production. The writer has at an earlier stage of the discussion indicated why a shortage of gold is probable in the proximate future. If such a shortage were to occur, it would be necessary to permit a gradual decline in ratios of bank credit and currency to gold reserves. This could for some time be accomplished by a deliberate secular increase in earning assets of central banks commensurate with the secular decrease in gold reserves. In the United States, the Federal Reserve Banks could add to securities owned at a rate sufficient to offset the deficit of gold. The funds released in this manner would provide a normal secular increase in legal reserves of member banks and in currency requirements of the public. However, if the process went on until the increase in central bank assets became excessive, a revision of systems of note issue would be necessary. The Keynes proposal to issue legal tender notes as rapidly as necessary to provide adequate bank reserves and adequate public circulation would be applicable. This revision would be simple and safe. Instead of limiting note issue by a fixed gold backing, or fixed maximum sum, we should then be limiting note issue by the requirements of a stable price level. This single change would provide adequate secular elasticity in bank reserves and in currency circulation, regardless of a decline in gold production. Yet it could be made without abandonment either of the gold standard, of exchange stability or of price stability. The Keynes dilemma—price stability versus exchange stability—would be resolved by accomplishment of both these objectives.

Necessarily, this summary of a positive program of price control indulges in some speculation as to what would probably happen in the future. Yet the uncertainties of the future need not deter the United States from trying the experiment. Her gold position is sufficiently secure so that the task of overcoming inertia in the outside world could spread over many years without jeopardy to her financial strength. All in all, she has an opportunity to make a unique contribution to the development of the money economy.

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